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Price: $5 per year, this issue $1.25

Entered as second class matter at the post office at Menasha, Wis. Acceptance for mailing at a special rate of postage provided for in the Act of February 28, 1925, paragraph 4, section 412, P. L. & R., authorized November, 27, 1931.

JOURNAL
OF
FARM ECONOMICS

VOL. XXIX August, 1947 No. 3

LAND ECONOMIC RESEARCH IN THE ALLUVIAL VALLEY OF THE LOWER MISSISSIPPI RIVER

ROBERT W. HARRISON*
Bureau of Agricultural Economics

THE economy of the alluvial valley of the Mississippi River is based upon an elaborate series of reclamation projects designed to protect the land from the annual rises of the Mississippi and tributary streams, and to remove surface water. Levees, drains, and pumps constitute a vast interrelated system, extending from Cape Girardeau, Missouri, to the Gulf of Mexico. This system is the result of a long and complex effort whose history encompasses the development of new engineering techniques, new or improved economic and social methods and institutions for handling the financial and social aspects of the expensive works, and even the evolution of political concepts.

Nowhere has this work of reclamation been completed, nor is it likely to be. Experience has shown that to succeed, the processes used in flood control must be as dynamic as the great river which dominates the life and history of the Valley. Drainage works are in constant need of repair and improvement. Not only is the reclamation incomplete but there is a noticeable variation in the level of accomplishment, measured either in terms of relative perfection in reclamation or in level of economic output. Thus, a fascinating opportunity is offered for comparison of the physical, economic, and social processes in the several areas as they bear on the level of land development and ultimately upon group welfare.

* Many of the topics in this paper grew out of discussions with my friend, Walter M. Kollmorgen. Mr. Hugh Wooten, Mr. John Mason and Miss Margaret Purcell offered material assistance. I am indebted also to Professor B. M. Gile, Mr. Charles R. Sayre and to many other economists working in the Mississippi Alluvial Valley. This paper deals with Land Reclamation. A second paper will concern research in the field of agricultural settlement and the rise of commercial agriculture.

Besides flood control and drainage, a third activity, land clearing, is essential to land development throughout the Valley. In practice these three activities—flood control, drainage, and clearing—have not been carried forward uniformly because they have been attacked by different interest groups and organizations and because the complexity of reclamation varies in different parts of the alluvial plain. Frequently land clearing has proceeded more rapidly than drainage, resulting in heavy personal losses and in social unrest. Land clearing as a step in reclamation is just as important as drainage or flood control, a fact which has frequently been overlooked in making settlement plans or other policy decisions. Allied as it often is with farm operations, the study of land clearing brings the problem of reclamation directly to the individual farm in a manner probably even more intimately associated with the farm business than land drainage. Closely associated with land clearing activities in the Valley are lumber companies, railroads, levee boards, and plantation interests. The relation of lumber companies, railroads, plantations and other institutions to land clearing and settlement, and thereby to drainage and flood control, forms one of the major axes for land economic investigations.

It is the purpose of this paper to show that in their broadest sense the accomplishments and failures in land development and settlement in the alluvial valley of the Mississippi River offer land economists an almost perfect setting for research in the anatomy of land reclamation. Such research should lead to knowledge of how best to effect improvements in the reclamation process and to remove some of the economic risk and physical hardships from land settlement, particularly "new-ground" settlement. This research should also serve as a basic framework for beginning analysis of the detailed adjustments expected in the cotton and sugar cane areas when mechanized equipment is again fully available. The long range significance of these adjustments makes it urgent that students of specific problems be provided with a workable knowledge of the general scene in which their individual work falls.

Some Misconceptions

In discussing the Mississippi's alluvial plain, the "Delta" as it is frequently called,[1] it is usually necessary to clear up a number of

[1] In conversations and popular writing the entire alluvial valley is frequently called the "Delta" or the "Mississippi Delta." The true delta begins near Angola, Louisiana (not at Baton Rouge, as is so often stated) and extends in a great fan shape to the Gulf.

popular misconceptions concerning the nature of the physical and cultural environment. First, the "Delta" is not a physically homogeneous area. There are wide variations in such basic factors as rainfall and length of growing season and consequently in crops produced. Furthermore, the soils while all are of alluvial origin, differ widely in the amount of silt and sand they contain and therefore in such important factors as ease of cultivation and drainage as well as productivity. There are noticeable differences also in elevation and slope from north to south in the Valley, slopes ordinarily being much greater in the more northern part. Naturally these factors are all of great importance in determining the type of agriculture suitable to various parts of the area. Physical differences are of decisive importance also in flood control and drainage engineering. North of Angola, Louisiana, for example, the Mississippi River is not running in its own alluvial deposit and the meander pattern is much less stable than below in the "true" delta.

The human, or cultural, geography of the Delta is also far from uniform, though rather frequently agricultural literature leaves the impression that it is a uniform land of large cotton plantations farmed by Negroes and managed by white "strawbosses." There are large cotton plantations farmed by Negro sharecroppers and managed by hired overseers, but there are also 40-acre cotton farms farmed by their owners and "managed" in considerable part by the local Farm Security Administration representative. There are also sugar plantations, and in juxtaposition small cane farms worked by the Acadians whose self-sufficient agriculture is one of the Nation's oldest. Large areas of coastal marsh land are "farmed" by trappers for muskrats, while some of the marsh lands have been reclaimed for vegetables and general crops through the use of dikes and large-scale pumping plants for exhausting the surface water from the enclosed area. Near the top of the Valley is found a relatively new economy, or type of farming, built around a rotation of corn, cotton, and soybeans on 60 to 140 acre farms settled mostly by immigrants from the Corn Belt. Here Negroes are rarely found, while a few miles away in areas recently settled by cotton planters moving north to escape the weevil, they constitute more than half of the population. With these facts in mind it is easy to see what errors one falls into by defining the Delta as typically southern in thinking and/or psychology.

True, in some segments of the Valley, plantation interests with

southern traditions predominate, but in many counties, perhaps most, small farmers from the hills of Kentucky, Arkansas, Louisiana and Mississippi; Negroes trying to clear "new ground"; subsistence colonists (from FSA days); and homesteaders (donators, they are called in Arkansas) settled on state land forfeited for taxes, rub shoulders. It is a mistake to think of the Valley's agriculture as either old and established or new and struggling. It is partly old, older than the Nation, and partly very new, as new as the last depression when many of its cut-over lands were first settled. It is rather a habit in agricultural circles to talk of the Delta as a rich and prosperous land, physically and financially, and to forget that it has been frequently a land where men failed to find the homes they sought, and where they grew old and poor fighting the forest from clearings not yet drained.

Apparently to every man—the cotton planter, the French sugar maker, the *Cajun* on his bayou bank, the Corn Belt immigrant with his tractor, the trapper in his pirogue, and the new-ground farmer with his axe—the Delta has a meaning, but it is a meaning as different as the men who live and build in the Valley.

It is clear then that there are no simple answers to the economic problems of the alluvial valley. In fact, there are no such answers to the much less complex physical problems. It is certain also that what to some appear to be perfectly impartial solutions, to others will seem far short of ideal, or even undesirable. Economists when functioning as administrators, must take care to distinguish between the ideas and aspirations of the various classes which make up the complex society of the Delta. Only in rare instances will the over-all directive be an effective social tool in the Mississippi Valley.

The Scope of Research

The objectives of most economic research are practical and for this reason are limited by what is presently important. Agricultural economics research in the Delta has been determined most often by considerations of current interest. This concentration upon immediate problems amounts to a predetermining of the range of research interest and has had the unfortunate effect of leaving unturned several important fields which almost certainly hold many clues to specific problems of immediate importance, and provide

the perspective essential to a dispassionate judgment and evaluation of the long-term economic affairs of the Valley.

In an area such as the alluvial valley of the Mississippi, where matters of great current importance—flood control, drainage, clearing, to say nothing of the usual problems common to cotton and cane production—are also those with which past generations were preoccupied, the study of economic history is particularly rewarding. In such a setting so many of the economic problems turn out to be problems of institutional arrangement that it is necessary to have a workable knowledge of local history to understand what will constitute a reasonable approach to even the simplest assignment. Work now in progress suggests that the historical phases of research in land development and settlement in the Valley will, when completed, provide a much better basis than is now available for understanding why various parts of the "Delta" have developed faster than others; how local institutions (particularly those connected with land reclamation) have developed and worked; and the degree to which outside influences are countenanced in local affairs. For example, research in the evolution of flood control policy, tracing the gradual shift of this problem from one of purely personal responsibility to one of Federal responsibility, affords an almost ideal opportunity to examine at nearly every stage in its life cycle the breakdown of a once deeply entrenched philosophy of individual and local responsibility. It will not be amiss to observe that this shifting of responsibility has made of the Federal Government a government of substance rather than a government of philosophy. Likewise, it places the individual or the local group in the position of pleading for help from a higher authority rather than acting on individual or local initiative. In this transfer of function which has taken place in the Mississippi Valley over the last 200 years, one will find the key to many current attitudes of "Delta" people concerning the function of the central government in land reclamation and development problems, and indeed, toward all agricultural problems. The history of the alluvial valley—the coming of settlers, the struggle to control the river, to clear and drain the land, to allocate the costs of these works among individuals and units of government, the rise of commercial crops, the changing concept of Federal responsibility—is then essential to the land economist in making his ap-

praisal, in answering the questions asked of him. The perusal of the economic history of the Valley is therefore properly within the scope of proposed and needed research.[2]

It is difficult in agricultural economics research to know how far to go in presenting physical data which are so intimately associated with economic affairs in agriculture. Even more difficulties than usual arise in this connection when the setting for research is the Mississippi Valley. Here, almost every question likely to concern the land economist has an intimate connection not only with climatic, soil, and agronomic facts, but with complicated engineering questions of flood control and drainage as well. At many stages in the research program of the economist it is desirable that he work closely with the research engineer in order that there may be an interchange of ideas and that each may understand the full program. In the past this proposed union of land economics with engineering has seldom occurred. There are a number of reasons why economics as a science has been so little associated with the extension of land reclamation measures in the Mississippi Valley. Primarily flood control and drainage functions, where engineering is dominant, have been furthered by political means. The catastrophic nature of floods served well the aims of local officials seeking support for their programs. Devastated fields and villages served the place of economic reports in justifying public expenditures. The advice of economists was hardly thought necessary; they were not usually helpful in emergencies. Thus, the history of flood control and land drainage in the Valley is in considerable part a recounting of political strategies, underlaid at best by humanitarian considerations and at worst by selfish motives, but seldom directed or even influenced by dispassionate students of economic data.

Economists need not unduly lament their absence in the Valley during the formative years. They are seldom in on the beginning of such ventures. It rather has been their lot to help salvage the ruins left by land promoters and over-enthusiastic sponsors of public works. Reclamation work in the Mississippi Valley has to a large degree passed the promotional stage. There is every reason to believe that future alterations and expansions in the flood control program can to a considerable degree be made on the basis supplied

[2] The vast collections of historical material relating to the Mississippi Valley have long interested economists though they have seldom found time to interpret them. The works of Phillips and Grey immediately come to mind as outstanding exceptions.

by economic analysis, rather than upon public excitement following flood as in the past. Likewise, drainage organizations—there are 600 or more separate districts or associations now active in the Valley—have gone through their initial period of wild expansion, beginning in 1900–07 and ending 25 to 30 years later in bankruptcy and years of inactivity, and are ready to begin the long and costly task of rehabilitation and integration of systems, tasks in which the economist may play an important role.

The proposed association of economics with engineering does not presuppose any loosening of the tie between economic investigations and the problems of sociology and rural welfare. Assuredly land economists working in the Valley will be interested, as always, in population, methods and patterns of settlement, institutions governing the factors of production, social experiments and innovations, and in the study of social trends which may influence land use. Certainly the emergence of a mechanized cotton and cane economy will force upon both the land economist and the farm management specialist a series of problems of the greatest urgency. The crop and livestock adjustments which technological improvements in production and changing markets for cotton and cane are making increasingly urgent, certainly are a major field for study by agricultural economists, as will be shown below in an outline for land economic research in the Delta.

In this review of the scope of land economics research, mention should be made of the political science aspects of the problem, i.e., the socio-government processes involved in land development and settlement. The introduction of so comprehensive a field may at first seem unduly to broaden the scope of land economics research, perhaps to overshadow it entirely. Reflection upon the scope and importance of government-sponsored activities in the Valley, not only in terms of the enormous contributions to flood control works but also to such problems as farm drainage, land settlement, crop adjustments, etc., will make clear the necessity of recognizing as a distinct phase of land economics research the part which government programs play. One of the major themes in the history of land reclamation in the Mississippi Valley is the ever-expanding role of the Federal Government. Recognition of the now dominant role of government in land matters should be followed by research designed to make clear the functions which government has assumed directly, those which it has assumed in cooperation with State or

local agencies, and those which remain to the individual. No small part of the confusion in land affairs in recent years in the Valley has arisen from the failure to comprehend the magnitude and the limitations of governmental functions. Later in this paper further comments will be made on research into the status of government in land affairs in the Mississippi Valley. Suffice it to say here that land economic research should, and does, have as one of its major aims the improvement of services rendered by government. It constantly must develop criteria for the evaluation of these services in terms of their contribution to society as a whole lest the pressure of vested groups lead to the practice of developing projects of only local benefit.

Sooner or later the economy of the Valley must be appraised in terms of its contribution to the general economy. Only by increasing this contribution can the heavy public subsidy to the Valley be justified. The earliest discussions of the proper function of the Federal Government in Mississippi Valley flood control work center around the contributions of the Valley to National welfare. Modern discussions must return to this pivotal issue.

So far in this discussion of the scope of land economic research for the Valley there has been an effort to avoid a statement of merely current problems, lest they obscure the long-run aims of the research program designed to serve as a basis for many types of short-term studies. There are, however, important current problems which will justify rather intensive study. Immediate need for study of land development and land settlement in the Delta arises out of the interest of returning veterans and others in farming, and the potential opportunities believed to exist for developing farm land in this region. Preliminary agricultural surveys of the Valley indicate that many acres can be developed for farming. These studies also have shown numerous problems in new land areas. Many unhappy farm settlement experiences have occurred. However, evidence also shows that in the past quarter century in certain parts of the Alluvial Valley many successful new farms have been created.

Many useful materials from the agricultural surveys in the Valley have never been thoroughly analyzed and summarized for publication. It is appropriate to review the reports and other data on new farming possibilities now available for the Delta and to make a reappraisal of the new farming problem, the opportunities that exist, and ways and means to realize on the opportunities.

Study of available opportunities should attempt to present the salient physical and economic factors which bear directly upon the development and settlement of new lands in this area. This would involve a study of (a) the nature of the land in the areas available for development, its extent and character, and present stage of improvement; (b) the recent experiences in land development and settlement with the view of bringing out causes of success or failure; (c) the impact of changing agricultural conditions, such as demand for farm products, use of farm machinery, and improved production methods; and other economic and social activities which are now affecting the direction of future agriculture in the "Delta" area.

An appraisal such as that outlined above, of new land development in the Lower Mississippi Valley, cannot be made without rather detailed study of the work various public agencies have and are contributing to the reclamation of these lands. Only after the reclamation phase of work in the Alluvial Valley is set forth will it be possible to describe adequately the agriculture of the Valley and to view the prospective development. The second part of a study, dealing with future possibilities, is more complex than that dealing with inventory and analysis of the present land situation. The influences affecting future development are highly diverse. Only by carefully examining this past and present diverse agricultural picture will it be possible to gain some hints regarding future possibilities for new farms in the lower Valley.

Physiography of the Alluvial Valley

There is not sufficient appreciation of the degree to which the present and potential economy of the Mississippi Valley is molded and limited by physiography. The nature of the natural levee formations, of the bayou as a distinctive type of stream pattern, the variety and sources of soil-farming materials, the multiple-basin character of the alluvial plain, and many other elementary physical facts have been largely neglected in planning agricultural expansions or other economic operations. Frequently, these same physical conditions have been overlooked or improperly interpreted by flood control and drainage specialists, with consequent loss in efficiency of their structures.

In recent years several comprehensive studies of the geology and hydraulics of the Alluvial Valley have been carried out by the Mississippi River Commission and the United States Waterways Ex-

periment Station. This research and other investigations, as those of Russell, of the natural character of the Valley must serve as the basis for future economic studies whether of new land development or better protection from flood and drainage water for present cultivated areas. The structure of the Valley and the character of the river which created it are therefore the first factors for consideration in all economic appraisals whether they be flood control surveys, agricultural drainage studies, wildlife refuge selection analysis, marshland reclamation reports, or selection of land suitable for clearing.

It will be necessary in many instances to undo or abandon some of the land reclamation work done in ignorance or defiance of the physical structure and laws of the Valley. Much of the expensive drainage system installed between 1905 and 1920 was engineered without regard to or undrestanding of the requirements of the physical setting. Social or political considerations frequently determined the locations of drains, levees, and dams. These will have to be relocated in many instances to conform to the physical setting.

Such current questions as possible means of reducing the acreage damaged by backwater, the development of floodways, selections of coastal marsh areas suitable for reclamation or development of planned siltation programs are all related closely to the physiographic situation. The absence of adequate topographic maps and air photographs has in the past often made it difficult, even for the specialist, to get a clear mental picuture of the valley in terms of a unit or great basin, made up of several major and many minor interrelated basins. Now that detailed maps and aerial mosaics are available, it is important that the land economist bring these into use as a basis for planning even the smaller flood control and drainage structures. Where large-scale clearing and settlement operations are planned, detailed studies of physiography must be made. Failure to make these physical surveys cost the Farm Security Administration many thousands of dollars, the expenditure of which did not begin to correct or make up for original mistakes in selection of sites for colonies.

It would probably be difficult to find an area where so much work has been done in disregard of the physical character as in the Alluvial Valley of the Mississippi River. The localization of political power has led to a series of futile attempts to solve on a local level such physical problems as flood control and drainage which required

action on a broader than local or even state basis. The development of a systematic approach to the problems of land development and settlement will not be easy in the Mississippi Valley where many faulty methods of carrying out flood control, drainage and clearing have become institutionalized.

The sections on physiography in the proposed research reports on land development and settlement possibilities should contain sufficient data to make clear the major physical characteristics of the Valley and the importance of investigating them when planning land developments.

Flood Control

Very few studies of the economic basis of the flood control program as it is carried out in the Mississippi Valley have been made. Even the more or less obvious phases, as the land taxes imposed by levee boards have been treated imperfectly or neglected entirely. Probably more is known about drainage district financing and philosophy than about flood control, yet throughout the Valley, flood control is the primary reclamation upon which all secondary agricultural drainage, irrigation, and clearing works rest. Research into the origins of the flood control program and examination of its current status are therefore essential to an understanding of the Valley.

Early settlement records attest to the elaborate means used to protect the lands from annual floods. As cotton and sugar plantations were established along the Mississippi River, land proprietors were held responsible for building levees along their property and for keeping them in repair. Local laws provided for assessment of fines in case of failure to perform this function. In the more prosperous days of the pre-civil war sugar industry, slaves were rarely used on the levees, being considered too valuable for such heavy work in the malarial swamps. Gangs of immigrant Irish laborers under harsh contractors built and kept the levees up to grade along the lower stretches of the river.

Complete dependence upon private efforts for flood protection soon gave way to group responsibility. The parishes devised several methods of carrying out and paying for flood control works. In the early years, county (or parish) and state-owned slaves and prisoners were used. In Louisiana the Board of State Engineers (organized early in the 19th century) supplied a rather high level of

technical guidance. The little known early reports of this agency are among the most valuable histories of early flood control undertakings.

Probably the most intensive efforts to put flood control projects upon a State basis came shortly after 1850 when the United States Government granted the States all the "Swamp and overflowed" lands within their borders on the condition that they be sold and the money used for reclaiming as much of the low land as possible. The Mississippi Valley States set up very active swamp land administrations. Review of the work toward reclamation (flood control and drainage) done under the Swamp Land Grants of 1849 and 1850 has shown that this was a very important period in the history of land reclamation in the Mississippi Valley, a period in which policies and methods were established which have had permanent influence on the institutions carrying out flood control and drainage work. A study of the administration of the Swamp Land Grants is now under way as a part of land economics research in the Valley. Besides yielding considerable knowledge directly related to flood control and drainage, this work, it is hoped, will lead toward a fuller knowledge of the early settlement patterns of the Valley. The Swamp Land Acts were administered in ways which favored the expansion of the plantation type of organization in many areas. Sufficient analysis has been made to show the relationship between the methods used in administering the Swamp Land Grants and the growth of the plantation economy, particularly in the cotton areas of Louisiana, Arkansas, and Mississippi.

The failure of the French-speaking farmers, settled along bayous of lower Louisiana, to take an active part in swampland affairs or to buy marsh and overflowed lands from the Board of Swamp Land Commissioners and later from levee boards, has had a profound influence on their economy. These lands upon which they depended as hunting and fishing areas are now held by absentee owners who exact high rents in terms of the animals trapped.

These are illustrations of a few of the many influences of the Swamp Land Acts upon agricultural development in the Mississippi Valley. These Acts represent the first important Federal legislation in the field of agricultural drainage.

Reclamation development so hopefully begun under the Swamp Land Acts was destroyed largely during the Civil War when the uncared for levees were all but washed away. During reconstruction

some efforts were made to put the old swampland administrations in operation, but most of the easily reclaimable swamp land had already passed into private hands and efforts to sell the remaining swamp and overflowed lands were largely a failure. Clearly a new method of organizing local interests for flood control efforts was needed.

Levee Districts

A partial answer to the need for organizing local interests in the fight against floods was found in the creation of levee districts. These governmental units, with police and tax power were created in great numbers in the late 19th and early 20th centuries. The creation of the Mississippi River Commission in 1879 stimulated the formation of many levee districts. Levee boards were instructed to work closely with the Commission. Funds of levee districts were used to match the funds appropriated by the United States Government for river improvement work which, though carried out largely under the name of "navigation improvement," was actually a flood control effort.

The history of levee districts is important since these districts for many years served as the major connecting link between local interest and the Federal efforts at river improvement and flood control. The fact that many thousands of acres of swamp and overflowed and tax-forfeited lands were granted levee boards by the States greatly increased their importance. In the history of levee districts, particularly the history of their financial contribution to levee building, we find an excellent illustration of the general trend toward a greater reliance on the Federal grant for financing, direction and control. The modern levee districts do little but police the levee. Each year the contribution of the local district to the financing or actual construction of levees has grown smaller. In some instances, they do not even provide right-of-way for setback levees when these are required. The providing of right-of-way was one of the chief functions of levee districts when they were first organized. In the changing concept of levee district duties, is reflected many of the changes in philosophy and attitude toward the functions of the several levels of government.

Research into the place of levee districts in the economy of the Mississippi Valley should make available better data than we now have on the financial contribution of local people to flood control

work. Very few studies of the financial structure, tax policies, and land policies of local levee organizations have been made. The fact that levee districts have broad police powers and taxing privileges has made them appropriate bodies to take over some of the functions heretofore assigned to local drainage districts. The levee districts along the Red River are under the encouragement and direction of the Louisiana Department of Public Works now in the process of assuming some of the local drainage responsibilities. If local participation in flood control is to become more meaningful both in terms of financial contribution and in public understanding, levee districts must be put on a sounder basis. Research now in progress includes a detailed examination of the current financial status of levee districts and a study of their history. It is hoped that this research will lead to an appraisal of the potential usefulness of levee district organization. Unless they can serve a more positive function than is now the case, they will soon become dead units of government, cluttering legal records but serving no practical purpose. As the currently organized and legally empowered link between Federal and local governments, they may yet have a place in reclamation work. What this place will be will depend to a large degree upon the attitude and planning carried on by the State governments.

Federal Efforts

The magnitude of the Federal efforts to improve navigation and control the floods of streams in the Lower Mississippi Valley has tended to obscure the relation of this great work to the specific problems of land development and land settlement in the Valley. The economic aspects of the Federal flood control program have not been considered sufficiently. Such studies as have been made have been confined either to details of hydrology or other phases of engineering or have recorded the political aspects of flood control and navigation legislation. Valuable as these studies are, they fail to answer the questions of the economist.

In the formative years of the flood control effort, little attention could be given to the refinements in the sytsem. The main task of preventing annual devastating floods consumed all energies, both engineering and political. Flood protection, although not assured, has reached the point where considerable time can be turned to refinements in the reclamation process. These refinements will in-

volve careful economic analyses, and where they envision new approaches to the basic methods of flood control, they will bring also into operation new engineering research. For example, many of the plans for reducing the major backwater areas, which occur where main line levees are broken to admit major tributary streams, demand careful agronomic surveys to determine the quality of the land which will be protected under alternative engineering plans. Where agricultural developments have begun in backwater areas, the social and economic life of these settlements must be considered. Likewise, the problem of locating floodways or undertaking siltation[3] programs which may lead to new land developments or provide for better protection for settled areas involve land economic surveys of various types.

The Federal flood control work in the Mississippi Valley has been in a large measure achieved by constant resort to political *pressure supported* by aroused public sentiment following major floods. This method of promotion has resulted in many disharmonies and has become less appropriate as the reclamation has matured. One of the major responsibilities of students, citizens, and public administrators interested in the Mississippi Valley is to work toward an economically sound method of financing flood control work. No categorical answers as to what methods are appropriate to this task are possible. The land economist working closely with the engineer and the public administrator should be able to make a substantial contribution to this field. Land economics research now under way in the Valley includes a detailed study of the evaluation of the flood control program in terms of political and economic responsibility for the task. Whether the trend toward increasing Federal financial contributions and control should continue is problematical. There may be opportunities for more meaningful local participation now that the initial building period is past.

National public subsidy for flood works in the Mississippi Valley has reached staggering proportions. Increasing attention must be

[3] The possibility of developing many thousands of acres of land lying in the lower Mississippi Valley through a planned program of siltation is worth exploring. The waste of soil resources under the present system is tremendous. It is possible that a large part of this waste could be avoided through the use of floodways leading into the natural interstream basins of the lower valley. This type of conservation is actually in operation in the Atchafalaya Basins, although the floodway was designed with flood control and not land development in mind. At a later date flood control structures may serve the dual purpose of protecting old areas and creating new ones.

given to the justification for expenditures of public money in the Valley. A critical appraisal of the contribution of this heavily subsidized area to the welfare of the nation leads to a consideration of the economic opportunities the Valley affords, both realized and potential. While land economists are perhaps chiefly concerned with the immediate problem of the efficiency of the reclamation works (flood control, drainage, and clearing) they are also deeply concerned with the changing status of the major crops of this valley, cotton, sugar, rice, etc. in the economy of the Nation. The heavy public subsidy of recent years to producers of the chief crops of the Valley make it doubly necessary that subsidy to land reclamation be kept at a minimum pending economic adjustments which will lead, it is hoped, to a sounder general economy in the Valley.

Unfortunately economic studies relating to flood control have never been publicized properly. Some of the excellent reports of the Mississippi River Commission and the U. S. Army Engineers are almost unknown. Much of the basic material is unpublished. Collection and organization of this material is the first step in an economic appraisal of the Valley. The work is now in progress.

Drainage

As stated above, flood control, drainage and clearing are three basic steps in land development in the Mississippi Valley. Work in these three fields has advanced simultaneously, but not necessarily uniformly. Sometimes drainage works have advanced more rapidly than the status of flood control warranted, with consequent loss of capital investments. Often clearing for agriculture has got ahead of drainage, resulting in much suffering and economic loss to the new-ground farmer and his family. Thus, while drainage and flood control are parts of the same task, they have different histories. The drainage movement and the flood control movement in the Mississippi Alluvial Valley are different entities, requiring separate study. A step essential to the eventual integration of these two closely related programs is an understanding of their separate histories. Flood control and drainage interest seem often to have fought against each other. This struggle, however, has arisen not out of any basic physical conflicts but from the short-sighted interest of various landed groups, as lumber company against crop producers, established planters (located on the higher natural levees) against the new-ground farmer of the lower interstream areas, etc.

Research in drainage now in progress falls into three broad fields:

1. A study of the present status of drainage organizations, including an analysis of their current finances, tax practices, and relation to bondholders and credit agencies.

2. An examination of the history of the drainage movement and the relation of drainage works to the physiographic setting, on one hand, and the structure of rural society in the Valley on the other. (This involves an examination of the major economic interest sponsoring drainage and research into local institutions which they have developed. Sufficient research has been done in the Arkansas-Red River segment of the Mississippi Valley and in the Teche and Lafourche basins of lower Louisiana to show that deeply entrenched local institutions for handling drainage are inappropriate to the physical problem which confronts them. In such situations improvements in agricultural drainage becomes a slow social process requiring patience and skill in seeking to combine the divergent short-term interest of conflicting local groups.)

3. An evaluation of methods for local, State and Federal contributions to agricultural drainage work.

The third field of research in drainage is of considerable current interest in states such as Louisiana where a reorganization in the structure of the local drainage organizations is under way. Studies falling under fields one and two are steps toward the factual data and are prerequisite to a consideration of method for agency.

The modern drainage movement in the Mississippi Valley originated early in the 20th century and reached a peak just before the first World War. In this period probably over 1,000 drainage organizations were set up under the various state laws which usually allowed them to levy taxes against property, sell drainage bonds based on their tax reports, and in other ways engage in the financing and carrying out of drainage programs.

Research now under way indicates that this vast drainage organization of the Mississippi Valley has gone through several distinct cycles in terms of physical accomplishments and financial operations. Studies of the drainage organizations in the basin lying west of the Mississippi River between the Arkansas and Red Rivers indicate that the average life of a drainage system receiving little or no maintenance is about 20 years. The financial history of drainage organizations shows that refinancing has taken place about every 20 years as rehabilitation is required. A very large proportion of the drainage channels of the Valley are now in need of

rehabilitation, and the financial status of the districts indicates that a new period of refinancing must soon begin. Fortunately most drainage associations have been able during the last 5 years to liquidate much of their bonded debt. During the 1930's refinancing through the Reconstruction Finance Corporation was effected for most of the larger districts. In this process about 45 percent of the drainage debt was written off and the remainder refinanced at a lower interest rate. The refinanced debt in the great majority of cases is being retired in an orderly fashion and in many cases has been paid completely. As drainage organizations are now relatively free of debts for the first time in 40 years, and as major improvements must be made soon in the system, most of which have been completely neglected during the war or longer, it is an ideal time to consider their status, history and plans for future operations.

While the experience and degree of success of drainage districts in the Mississippi Valley has varied greatly, certain weaknesses in the general system have long been apparent. In almost every case districts have been too small to deal successfully with the drainage problems. Engineering has been faulty and undertaken in such a piecemeal fashion as to preclude an understanding of the basin-wide relationship. Local control has been so rigid and jealously guarded that cooperation between districts has been impossible, and frequently feuds have been carried on to the detriment of all parties.

Improvement of drainage affairs has long been desired. A number of State agricultural colleges have made studies of the local improvement district laws and of the actual operation of the drainage districts. The great burden of old debts made it impossible to seek new methods or organizations for carrying out the programs. The assistance of the Federal Government was limited to offering some technical aid, to helping with refinancing programs through the Reconstruction Finance Corporation and to providing limited amounts of rehabilitation through the Works Progress Administration and related agencies.

This picture has been radically altered in the last three or four years by the greatly-expanded Federal contributions to drainage work. The Soil Conservation Service has undertaken to expand its contribution to on-farm drainage engineering. Conservation districts have been established throughout the delta area of Louisiana and Mississippi. Some progress is being made in organizations in

Arkansas. In Missouri very little drainage improvement has been done by the Soil Conservation Service. Besides the work of Soil Conservation Districts, the Federal Government, through the U. S. Engineers, is now engaged in improving major drainage outlets.[4] This work is of the greatest importance to the Mississippi Valley States. In the past, flood control and navigation funds have not been available for drainage work. The redefinition of the term "flood control" to include "major drainage" has opened an important new field of responsibility for the War Department. The development of this responsibility is just beginning. Its influence on the future of agricultural drainage in the Valley is certain to be profound.

Development of these action programs on the Federal level has raised many difficult questions of local and State participation. Under the system of locally organized and managed drainage districts, which has prevailed throughout the Valley, the State governments maintained little interest in or control over drainage affairs. In some States records at the capital concerning drainage are so meager that it is difficult to obtain even the names of the active districts to say nothing of the details of their operations. Research now in progress has made clear the urgent need for closer State control over drainage planning and operation.

The present condition of district affairs makes this an auspicious moment for development of active State administrators capable of surveying local needs and working with Federal agencies active in drainage engineering and financing. The number of local organizations is so great and their individual jurisdiction so limited that it will be difficult for them to work with Federal agencies. Probably the most important aspect of drainage research now under way is the attention it will call to the need for carefully planned State programs to represent local interest.

The state program often falls far short of the ideal of a Valley-wide coordination of reclamation work. In the past, a number of "State-line" drainage controversies have done much damage to the development of a unified drainage program for the Valley. It is hoped that the presence of Federal interest in "major drainage" will prevent effectively these costly interstate feuds. In the absence

[4] Public Law 534—78th Cong., 2nd sess. provided: "That the words 'flood control,' as used in Section 1 of the (flood control) act of June 15, 1936, shall be construed to include channel and major drainage improvements," p. 9.

of a completely unified program for the reclamation of the Valley, active state agencies for coordinating the work of the many local organizations seem to be the best arrangement. Louisiana now has an active State organization working with the Federal agencies on agricultural drainage. Mississippi and Missouri have at various times had active state departments working with local and Federal groups on water problems. Their programs should be enlarged and broadened to cover some method of relieving the local districts of some of the the responsibilities which they have proved poorly suited to carry. Arkansas has not developed an active state agency for studying drainage needs. Such an organization is needed greatly. Studies of the history of drainage, and particularly of the institutional aspects, should enable public administrators to develop workable state departments.

The experience of the state of Louisiana in developing an active Department of Public Works, initiating a State-wide drainage program, is of interest to other states facing the problem of putting land reclamation work on a sound basis. This program aims to coordinate all drainage engineering on the basis of appropriate drainage basins and all drainage financing on a parish or levee district basis. As a part of land economics research in drainage, the Louisiana program of reorganizing drainage is being studied with the hope that its desirable features may be introduced in other states facing similar problems.

Whatever state plans are made for administering drainage, they must provide for a large degree of interstate cooperation. The drainage basin is the minimum essential unit for planning drainage engineering even when such units are out of state lines. The outline shown above suggests a series of basin studies with the aim of calling attention to the natural areas which cannot be ignored if efficient drainage is to be achieved. Once these have been fully acknowledged, the several states are in a position to work toward the fulfilment of the basin-wide drainage plan.

Land Clearing

Land clearing is so closely allied to the land settlement process that it is studied frequently as a part of the settlement phenomenon. Reports on the development of our agriculture pass lightly over the clearing period with little but romantic reflection and wonder at how the herculean task of removing the forest was

achieved. In the Mississippi Valley where large areas remain to be cleared, it becomes a practical matter to obtain more detailed data not only on the actual history of land clearing but on new methods and techniques. Toward this end land clearing studies are being assigned a place in the general study of land reclamation where the techniques of clearing can be given the same attention now centered upon flood control and drainage aspects of land development.

Research in clearing will encompass three important fields: (1) the evolution in the technique of land clearing; (2) a survey of the institutional pattern of land clearing as it is carried out in the Alluvial Valley; and (3) the scope of probable future clearings and estimates of the land suitable for clearing for cultivation or pasture.

Power equipment and explosives for clearing land are now becoming available. Little equipment was manufactured for this purpose during the war. The new machines are, for the most part, much improved. Surplus equipment, caterpillar tractors, graders, etc., is now available in large supply. These facts help to account for the extensive clearing operations now under way in the Alluvial Valley and for the extensive plans for further work.

Comparative cost studies of land clearing operations are needed badly. Some scattered records are now being made by machinery and explosive manufacturers, but these should be supplemented by one or more comprehensive surveys. Cost studies of clearing are now being planned.

Important as comparative costs are to an intelligent understanding of current clearing problems, it is probably more important to know something of the actual process by which land is cleared. This involves a study of several institutional arrangements. Studies of new-ground settlements in Louisiana indicate some of the common methods used in getting land cleared. Many of these methods work to the disadvantage of the laborer who is a prospective settler. Enough is known of the complexity of the clearing practices to plan research which will encompass the clearing operations of plantations, lumber companies, and settlers on tax-forfeited land. State land agencies, railroads, and various credit agencies also have an interest in the clearing process.

The practices and methods as well as the ultimate social result of clearing operations vary widely for the various parts of the Valley. Sometimes important differences in State law and management of tax-forfeited land account for this difference; in other cases the

policy of local lumber companies or other landed interests distinguishes the area. In some parts of the Valley, notably in northeast Louisiana, the sale-contract has been used frequently as a method for attracting settlers to new-ground areas where they are offered land without having to make any immediate cash payment. Later payments frequently proved oppressive and the land was turned back to the owners but not before considerable acreage had been laboriously cleared. In a number of instances important plantation communities were cleared in this fashion through the use of sale contracts. This illustration is not intended as an indictment of the sale contract, but only of the improper use of this instrument or of its specific terms.

The probability that the Federal and State Governments may at some time assist veterans in developing farms in the Alluvial Valley makes it particularly desirable that information on clearing practices and the extent of areas suitable for farming be kept up to date.

Much field survey work is required in making the type of studies outlined above. The excellent air photographs covering the Alluvial Valley are of considerable help, particularly as the various series of photographs make it possible to study the rate of clearing for selected areas. They are valuable also as an aid in selecting areas to be surveyed by enumerative methods.

Getting Coordination in the Reclamation Program

Students of the Mississippi Alluvial Valley usually are impressed with the scattered, piecemeal, and seemingly unrelated attempts at flood control, land drainage, and clearing. It is only in the last 20 years that a degree of unity and coordinated planning has been achieved in the administration of flood control efforts. The predominant part the Federal Government has taken in flood control efforts accounts for whatever coordination there is in this work. In the more than 200 years during which local and state groups dominated flood control planning, nothing worthy of a unified program for the river was developed, though many men saw the need for such Valley-wide planning.

Drainage planning is now in about the same condition that flood control work was 75 years ago. Needless to say, land clearing remains largely a matter of private concern. In many instances drainage and clearing have taken place in areas where flood control was inadequate—in backwater areas for example. In still more cases

land clearing has proceeded faster than drainage. Families by the hundreds have had to abandon the land they cleared with great sacrifice because they were located in areas where drainage was not yet sufficiently developed to warrant agriculture.

So commonplace have these experiences become that it is a popular saying that it takes three generations to clear a farm and get it going. It is true enough that efficient drainage systems have seldom been established in the "Delta" until one or two generations cleared the land only to lose it to the newcomers who, having wasted no resources in clearing, could afford to begin a drainage effort. It is easy to see the enormous inefficiency, public and private, in such disorderly methods of land settlement and development. Many county officials now face the difficult task of providing public services to communities of new-ground farmers who have settled in isolated areas which it is doubtful that they will be able to retain. Roads and schools for these communities are, of course, desired and desirable, and in many cases have been provided. Later it has been discovered that they were not permanently needed or should have been located elsewhere.

The careful planning of settlement in the Alluvial Valley would require drastic legislation and many revolutionary changes in the thinking of local groups. Such well-known concepts as those involved in zoning laws have little place in the political thinking now current in the Alluvial Valley. The steps toward a coordinated and somewhat planned reclamation program will be slow, but they are gradually being made. Research which shows the potentialities, in terms of the individual and public economy, of the alluvial soil and the conditions essential to its successful and orderly reclamation, will do much to bring the desired unity of action among reclamation interests.

GUIDEPOSTS IN THE DEVELOPMENT OF A MARKETING PROGRAM*

JOHN D. BLACK
Henry Lee, Professor of Economics, Harvard University

YOU have given me a difficult assignment this morning. But of course it is no more difficult and no different from the assignment that has been given all of us who have now been set to work anew upon the marketing problems facing agriculture and the country. What I am therefore saying is that the marketing problem as a whole is a difficult one. It is more difficult by far than most of us realize.

This can be made clear by stopping to ask ourselves why this assignment has been given to us at this time. The first answer is—for the same reason that marketing was brought to the fore after the first world war. You may remember that the reports of the Commission of Agricultural Enquiry set up at that time were mainly devoted to marketing, and that there followed from it a whole series of federal and state legislative acts. The federal legislation included the acts regulating the grain, cotton and other commodity exchanges and the livestock markets and a long list of other regulatory acts: the Capper-Volstead cooperative marketing act; and the act setting up the Division of Cooperative Marketing in the Bureau of Agricultural Economics, later to be transferred to the Federal Farm Board and finally to the Farm Credit Administration. It was in this period that many of the offices of the state commissioners of markets were created, or marketing divisions of state departments of agriculture, and that most of the states passed new or amended cooperative marketing acts patterned after the Aaron Sapiro model. The crowning development of this period was the passage of the Agricultural Marketing Act setting up the Federal Farm Board in 1929.

* * *

What were all of these measures driving at? What did those who promoted them hope they would accomplish? My answer may startle you a little. The agricultural reformers of those years were not interested in marketing as such, but only in marketing as a means to an end; and that end was higher prices for farm prod-

* Paper presented to the Marketing Conference of the Massachusetts Agricultural Program Board, Feb. 27, 1947.

ucts—not just a *little* higher farm prices, but *big* increases, enough to bring them back to what was called "fair exchange value," or "equality of exchange," and later "parity." These terms were first used by George Peek, you may well remember, at the big Agricultural Conference which Secretary Henry C. Wallace called in the winter of 1921–22. They became the basic conception of the McNary-Haugen Bills that absorbed most of the effort of the agricultural reformers from then until the Hoover election, and were twice passed by Congress and vetoed by President Coolidge.

That my thesis that the real objective of the reformers of this period was *prices* and not marketing as such, is true is evidenced by the fact that the McNary-Haugen plan was scarcely marketing at all, especially in its earlier phases. It went directly at the matter of raising prices by proposing to force enough exports from this country to raise domestic prices to the full level set by the tariff duties. With tariffs supposedly set at the difference between cost of production at home and abroad, under the flexible provisions of the Tariff Act, this, Mr. Peek reasoned, would assure farmers of cost of production and fair exchange value.

The Sapiro marketing program had this same emphasis on prices. Its essential mechanisms, it soon became evident, were designed to give the farmers control of the whole supply of the product, and enable them to name their prices F.O.B. the farmers' shipping points. The "orderly marketing" that he presented as his central idea meant in action the holding of farm products off the market, even over until later years in the case of non-perishables, so as to raise current prices in the hope that the future would take care of itself. Most people fail to realize how well the Sapiro philosophy was sold to our people in those years. President Coolidge virtually accepted it; it became the basis for all of the legislative proposals put forward by his administration, including the Capper-Williams bill of 1925. Hoover, then Secretary of Commerce, was of course the real author of that bill, and his Agricultural Marketing Act was only a later form of it, made over to make it more acceptable to the big cooperatives. Orderly marketing in this Act was to be achieved by developing "farmer-owned and farmer-controlled cooperative marketing systems," to which commodity advances were to be made to enable them to hold products off the market, and by setting up "stabilization corporations" to do the same thing in an even larger way.

The difficulty that arose with this program was that *the future did not take care of itself;* the products held off the market accumulated into larger and larger totals and shortly the half-billion dollar revolving fund was all tied up, and President Hoover would not ask for more revolving funds. Moreover, it is to be doubted that funds such as the three or four billions voted the Commodity Credit Corporation ten years later would have saved the situation. The surplus stocks would have piled up to still larger totals, which would have plagued us all during the 1930's.

The Federal Farm Board members, accordingly, and for that matter pretty much the whole farming community, then shifted its thinking to the need for keeping new production from adding more and more to old carryovers. We all began talking about "orderly production" and largely forgot about orderly marketing for a while. A few people had talked about orderly production in the 1920's. They even got Coolidge to put a paragraph about it in his first presidential speech on agriculture at the Chicago International Livestock Show. But Congress had no interest in this approach and would not even hold hearings on the Christgau Bill of 1928, based on this approach. The Agricultural Adjustment Act of 1933, in contrast, contained only a few paragraphs about marketing. It was going to raise prices by production control.

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You may be wondering by this time why I have recited this bit of history with so much care. The simple outstanding fact of the present situation is that the agriculture of the country is now looking forward to a new price decline such as occurred in 1920–21, and again we have acquired a strong emphasis on marketing measures as a way of dealing with it. The main difference is that this time we are anticipating it and beginning to prepare for it, and last time we didn't.

* * *

Why do we turn to marketing measures again? This is indeed an interesting question. One answer now being given is that the Republicans are again in the saddle. But I doubt whether this has any major value as an explanation. No doubt it is to some extent a reaction against New Dealism which in agriculture has come to be associated with production control. A more important connection is that the Republican party is more business-minded than the

Democrats, and the minds of its leaders turn to solutions of problems that can be made within business itself. But it is also highly significant that Congressman Flannagan of the Hope-Flannagan Act, was Democratic Chairman of the House Agricultural Committee, and his Democratic predecessor, Fulmer, was even more convinced that the problems of agriculture had to be solved in large measure through marketing reform. It was while he was still chairman that the special commission was set up to study farm marketing problems. Moreover, the first marketing reform measures were taken in the Democratic administration of Woodrow Wilson.[1] It was under him that Secretary David Houston set up the Office of Rural Organization and Markets in 1913. This later became the Bureau of Markets and was expanded into a national organization employing by 1919 over a thousand workers devoting their time mainly to such marketing services as market grading and inspection and market news. There can be no doubt that the resort to marketing measures as price-raising devices in 1920 and following is due in large part to the strong marketing reform movement that was under way at the time.

And although the emphasis shifted after 1931 to production adjustment, the exponents of marketing reform were by no means entirely relegated to oblivion. In fact, Mr. Peek, as co-administrator of the AAA in its early months, undertook to blow up the paragraphs in the Act on marketing agreements into almost a complete program for the AAA, by trying to get the big tobacco companies and others to enter into agreements with the government to pay parity prices, and it took a reorganization of the AAA to stop him. Presently Section 32, which permitted disposal of surpluses outside the usual channels of trade in the foreign and domestic market, was added to the Act. And although the marketing agreements, or orders as they were called after the Schechter decision, came to be used almost solely in milk markets, they were made, by subsequent court decisions and revisions of the law, into more vigorous instruments of marketing control. Finally, it is safe to say that with the break in farm prices in the fall of 1937, with the parity ratio again falling below 80, the farmers of the country, and their congressional spokesmen, lost faith in production control as a sole

[1] It should be added that although marketing reform was first implemented federally in 1913, it had really begun as part of the Country Life Movement of the later Theodore Roosevelt years in the White House.

device for insuring good prices, and began to revive their old interest in marketing measures. This revival was strengthened by the heavy impact of marketing on them during the war years. Accordingly, our farmers and Congress were ripe for the drive conducted by Hope, Flannagan, the Cotton Cooperative Council and others, out of which came the Hope-Flannagan Act.

* * *

But again we must not make the mistake of thinking that the interest in marketing is in marketing as such. Again the objective is in good prices, and in marketing only as a means to this end. This becomes very clear if one reads the statements made by men like Fulmer and Flannagan in the hearings and congressional record. A letter in my files from Congressman Fulmer indicates clearly the lines of his thinking. As he saw the problem, it is the large profits of the middlemen that keep farm prices low. These profits must be kept from them and given to the farmers. Congressman Flannagan comes from a tobacco growing district of Virginia—nothing more need be said. Men like Fulmer and Flannagan see the problem in these very simple terms: Before the war middlemen agencies, including the railroads and warehousemen, were getting 60 cents out of every dollar paid by the consumer for food. This is altogether too much. We must take some of this away from them and give it to the farmer. Of course the consumer is entitled to some of it too; but that will help the farmer because the consumer will then buy more of his product.

If, therefore, the new movement for the improvement of marketing, in which you in this room and I are a part, is to satisfy its sponsors back on the farms and in Congress, it must give the farmers good prices for their products. Together with such production measures as are still retained, *the methods and procedures for improving marketing that we devise must suffice to keep prices of farm products up to a level that will fairly well satisfy the farmers, after the two-year support program ends in January 1949, as well as this year and next.* If they do not, marketing reform will again take a back seat.

* * *

What are our chances of doing this? Let's first see what the marketing reforms of 1921–40 accomplished. In terms of the farmers' share of the consumers' dollar, the record is far from encourag-

ing—at least superficially. Back in 1913–14–15, the farmers were getting 46 cents of it, and 25 years later in 1938–39–40, only 39 cents of it—a loss of 7 cents! But perhaps the production control of 1933–40 had something to do with this—how about the years before production control? Four of the 7 cents were lost before 1929. In the depression following, the farmers' share fell to as low as 32 cents, but this always happens in depressions. Perhaps there is some encouragement in the fact that the recovery from the depression of the 1930's was 8 cents, and that from the depression of 1920–22 only 2 cents. But the 1930–33 depression was much the deeper of the two.

What the difference between the 8 and the 2 cents principally points to, however, is something much more fundamental. To show any gains at all in the 1920's, the marketing system had to absorb some large wage and rent increases. Urban wages came out of the first world war at twice their prewar level, and building costs almost twice. Freight rates settled down around a half higher than prewar. The general price level in 1928–29 was only around 40 percent above prewar, and most of the costs entering into marketing from 50 to 100 percent higher. Urban wages and rents, in contrast, did not rise anywhere nearly so much coming out of the 1930 depression. Hours of labor, however, were shortened considerably. Not only has the marketing system had to absorb these cost increases since 1913, but also provide more services along with the food distributed—longer hauls from primary producer to consumer as the cities have grown, smaller and more expensive packaging, and the like. No doubt some important gains in real marketing output per worker were achieved between 1920 and 1940; but we have no way of telling how much because these gains were swallowed up and more by higher wages, rents and transport costs.

* * *

Have I not proved by now my original statement that you and I have a very tough assignment? The farmers' share of the consumers' food dollar has been running as high as 55 cents in the last few war and postwar years. We are not expected to keep it at this high level—it is understood that such levels are merely accompaniments of the war. But we are expected to raise it considerably above the 45 cents where it will tend to settle, if we do nothing effective about it, when prices of farm products reach 90 percent of parity.

The question before this and all similar marketing conferences is therefore mainly this: *How is the 45 cents going to be raised to 50 cents, and 55 cents, and even* higher, *in the next ten years or so, which is what seems to be expected of us by those who have set us at work anew on the marketing problem.*

* * *

If we were instead given a similar assignment in production, we would find the answer vastly easier. We would know pretty well how to go about it. We would work with the actual farmers on their farms and figure out with them ways in which they can increase their yields per acre, per cow, and per hen; ways in which to improve the quality of their pastures and hay so as to reduce feed bills; in which to improve some of their land and make it more productive; in which to control diseases and pests; in which to increase the output per worker, per horse, or per tractor; in which to fit crops and livestock together so as to get a fuller use of their land, labor, and equipment; and so forth and so forth. These are all things that farmers can do within the boundaries of their farms that will lower their costs and increase their net incomes. We do not have all the information needed that would help farmers with these problems, but we probably have more of it than most of them will get around to using in the next ten years.

These same farmers may also have some marketing or near-marketing problems that we know how to help them with—problems of sorting, grading, and packing for the market; of finding the type of product that the market wants and producing to fit this want; of fitting their production program to the seasonal demands and prices in such a way as to get the highest margin of prices over costs; and finally of adjusting their volume of output and combination of products to changing market demands. These problems are generally referred to as problems of adjusting production to the market, and hence as production problems; but surely they call for a good deal of knowledge of marketing and correct understanding of marketing conditions. We may not be too well organized to supply farmers with the information on these subjects that they need; but at least we know the nature of the problem and how to go about getting the information and getting it to them. Give us the personnel for it and we can also handle this part of the job.

Even if these farmers were dairymen selling their own milk at

retail—producer-distributors—we would know pretty well how to go about helping them. Even their distributing problems of keeping down their processing and bottling costs and their wagon costs, and of protecting the quality of their milk, would be pretty well within our reach. We would also work with them on their problem of keeping their production and sales in line with each other over the seasons.

Suppose instead that a group of farmers around a market are organized into a cooperative—how much could we help? How well do we know the problems of such a cooperative? My answer in this case too is that we would be able to help this cooperative a great deal. We would in fact be able to help it about as effectively as we could help a milk producer-distributor. Undoubtedly we would need to make some studies of some of its problems, conduct some market surveys, and improve its market news service; but again we understand how to do jobs of this sort. If the cooperative were a large one serving a wide range of markets, what then? My answer is very little different from the last one. Much more study and survey would be needed, but the methods would be largely the same. All farmer cooperatives have important problems of keeping the production of their members adjusted to the market both as to type or quality and amount, and of membership relations generally; but these also lend themselves to analysis and successful attack.

* * *

Where, then, do our difficulties arise? They arise wherever the production is by one large group of operators acting independently, and the distribution by another group acting independently, *with no integrating mechanism between.* If there is a third group of independent processors in the system, the difficulties are more; and if in addition a group of independent wholesalers, and perhaps still another of brokers or jobbers, the difficulties are still greater. It is this breaking up of the distribution process into separate groups of independently acting operators that presents the main problems *that we do not know how to handle.* It was these problems that all our efforts in the 1920's and 1930's failed to do much with; and it was because of this failure that margins between producers and consumers widened.

Consider some of the things that happen when producers and consumers do get separated by all these intermediaries:

The first is that production, prices and consumption often get badly out of line with each other—as they have in the case of citrus fruits this season. The potato situation that has developed can be attributed in large part to government interference with the normal functioning of prices and the market; but not the citrus situation. In one of the wartime Januaries, I happened to drive past an immense pile of left-over Christmas trees over on the north side, apparently hauled from the North Station freight yards, that were being burned up to get rid of them. The prices had been set so high at the beginning of the season that the buying public had turned against them. That couldn't be blamed on OPA interference. It was free enterprise that did this. Neither can the high prices at which citrus juices were held all last summer and fall. Nor can it be said that such things do not happen in normal peacetime. They have always been happening in the fruit and vegetable markets.

Closely associated with the foregoing, the spreads or margins tend to be the same on big crops as on small crops, and everybody makes more profits out of a big crop than a small crop, except the producers. This keeps retail prices from rising and falling as much as they should, and this keeps consumption from expanding as much as needed to absorb the large crops. Sometimes, as a result, the producers cannot even afford to harvest part of a crop.

A third result is too many operators tend to go into business at the various levels in the marketing process—too many country buyers and country processing plants, too many commission merchants, wholesale receivers, dealers, and jobbers; and most of all too many retailers. Much of our criticism of the present marketing system runs in terms of high costs arising from too many links in the marketing chain. It is not the number of links that increases distribution costs, but the number operating at each of the links. The new type of marketing agent who makes a place for himself in the system needs add nothing to total costs. If there is a case against him, it must be on the grounds of making integration more difficult. But sometimes his particular function is actually one of integration, and he is the most useful of all market operators. The real problem is illustrated by the following: On Concord Avenue, between the Cambridge line and the Common Street railway viaduct, five new fruit and vegetable stores have appeared in the last year. If they all make a living for themselves, they are taking that much business away from other retailers somewhere. These other retailers

can stay in business only by raising margins on the rest of their sales, or getting along with smaller incomes. Most of them will manage to stay in business by a little of both.

The central idea in Congressman Fulmer's marketing philosophy was the high profits made by the middlemen. The same thought runs through much of the discussion of marketing problems by farmers and rural congressmen everywhere. But if the normal earnings of all middlemen were fixed at a level that a representative jury of farmers would accept as reasonable, and the rest of their earnings were distributed as farm product prices, such prices would not be raised more than one or two percent. A few middlemen make very handsome incomes, it is true. But this is a very small part of the distribution problem. *The problem is rather one of having so many trying to make a living as middlemen, and getting away with it just enough to keep them going, and all of the rest of us paying for their keep.*

As a factor in the foregoing is the fourth item in this list, the manner in which competition works under the foregoing circumstances. In place of lowering costs by increasing efficiency, as in manufacturing, the competitive force tends to spend itself in distribution on taking business away from competing firms, with maintaining rival sales organizations, advertising programs, and the like.

Under these circumstances, competition also works in such a way as to expand the services that go with the products much beyond what the buying public would pay for if it was in a position to decide. *Minorities rule in such decisions.* If a small fraction of the families in a community, *usually of the more well-to-do families,* want some extra services, the usual result is that all the merchants before long are providing them, and all the rest of the families are having to pay for them as additions to prices. *Thus it frequently turn out that the more well-to-do minority is able to force the rest of the community to pay for the services that this well-to-do minority wants, but that the rest cannot afford.*

* * *

The approach to this problem that the extension worker naturally takes is to try to make the individual marketing business unit more efficient. This is the approach that has been effective in production. This was the approach which we were following when I was at the University of Minnesota in 1918–27. Not only did we use it in our

extension work in our own state, but we trained young men to use this method and sent them out into other states—into Wisconsin, Ohio, Indiana, Virginia, Kentucky, Illinois, Iowa, Missouri, North and South Dakota, Montana, etc. It was fairly effective with the cooperatives, but if so, only because it enabled the cooperatives to outdo their private competitiors, take business away from them, force some of them out of business, and the rest to operate much like the cooperatives. Attempts to help private firms by these methods, however, were mostly dismal failures.

The schools of business about that time began setting up their so-called "bureaus of business research," which sought to help individual private firms to become more efficient. Eventually most of the schools of business had such bureaus. My own judgment is that they have reduced distribution costs very little. They undoubtedly have helped individual firms to operate on lower margins, if need be, and otherwise to increase their profits; but not usually have they lowered the general levels of operating margins in communities. Where they have succeeded in this, it has been because the more efficient firms have forced part of the less efficient to quit; and kept new inefficient ones from getting started. The usual situation is that enough new ones are always starting to keep the overall efficiency from rising.

The title suggested by the program-makers for this paper has the word *guideposts* in it. I hope that you have not lost yourself in the wilderness looking for them in what has gone before. Here, at least, is one guidepost which I shall set out where all can see it. The sign on this guidepost points in the other direction—away from relying much upon the old types of indiscriminate research and extension work with individual marketing business units, even largely upon such work with large numbers of small cooperatives.

The alternative approach now needed is in terms of *marketing systems as wholes* and trying to find ways of organizing them on more efficient lines. I shall concentrate most of the rest of this paper on setting up one large guidepost, with a great big sign on it pointing in a very definite direction. That sign is this: *Concentrate Your Effort on Better Integration of Marketing.* This means trying to get the various intermediaries in the marketing process to work together toward the common end of moving farm products through the market as smoothly and regularly as possible, with no unnecessary sales effort, with as few persons employed in it as possible, so as to keep costs at a minimum. Not only must the work of the

middlemen be integrated to these ends, but that of the producers and the consumers, so that what consumers want and will buy and what farmers produce fit together as nearly as possible, so that few surpluses pile up and consumers are deprived as little as possible of what they need or want because supplies are temporarily short and prices too high. If unusually good growing conditions unavoidably make large supplies, an integrated marketing system will work so as to move these supplies through to consumers at prices low enough so that they can afford to buy them. Or if it fails to do this, special pricing will be arranged that will accomplish it.

The simplest way to accomplish this integration is to set up large farmer cooperatives that handle the products all the way from the farm to the consumer; or, alternatively, large consumer cooperatives that do the same thing from the consumer end; or middleman cooperatives that operate along the same lines but from somewhere in the middle. These will put the whole marketing process under one management which is thus in a position to integrate all the steps in it and make all of them efficient. It would not be necessary to have all farm products handled in this way—if as much as a half or two-thirds of them were, this would set the pattern for the rest and the rest would have to operate in much the same way.

Practically, it will not be feasible to set up many cooperatives that take in the *whole* of the marketing process for a product. They may go only so far as the retailer, for example. But if they do, then cooperative retailing, or its equivalent, will be needed; and arrangements will need to be worked out between them that will integrate the two sets of cooperatives. Thus if a cooperative store system reaches into the wholesale market to do its buying, arrangements will need to be made for its integration with farmers' cooperatives that reach from the farm out to the wholesale market.

You in this room scarcely need to be told that we have cooperatives that fit into such a pattern. Several could be named that start at the farm end and do a good job of integrating marketing operations clear through to the auction markets or jobbers. Some operating in the central markets have worked out satisfactory integration with local cooperatives. The cooperatives handling farm supplies have given us a good demonstration of cooperation integrating from the buying end, but we have very little in this country, in contrast with some countries of Europe, of integration of the marketing of farm products back from the final consumer.

One way of achieving much integration in our marketing of farm

products would therefore be to take the existing cooperatives, fit them together, and fill in the gaps with new cooperatives, until we have a fully integrated marketing system. There would of course be room for proprietary enterprise everywhere in the system. But it would need to be as efficient as the cooperative enterprise. And to be so, it would need either to integrate its own operations, or to integrate these with the cooperative sytem.

Given such a procedure for attaining integration, the public agencies working in marketing would find themselves working with the cooperatives on their problems of grading and standardization, packing, processing, storing, freezing, adjusting the flow of the product to the market, adjusting production to the market, increasing the efficiency of use of labor and equipment and the like; and along similar lines with proprietary enterprises.

But although the approach by expanding cooperation is a simple and logical method for attaining integration, it is by no means the only way. Private enterprise can integrate too. The chain stores have given us a good demonstration of this. And one can easily name other examples of it in the farm product and food field. These have possibilities of doing as good a job of integration as the cooperatives. It is to be hoped that private enterprise will make the utmost of its opportunities along these lines, and will contribute its full share to the successful encompassment of this problem.

Private enterprise has some difficulties peculiar to it in such integration. The first one is that large proprietary firms are susceptible to monopolistic tendencies, such as exhibited in the form of price leadership, resale price maintenance, local price discrimination and the like; and even if they do not fall prey to such tendencies, the buying public tends to suspect them of it. We know by this time that cooperatives can acquire monopolistic behavior traits too; but they are less likely to do so. Some protection of the public has proved to be necessary even against large cooperatives—much more will be needed if a large integration under private management develops, unless private management will find ways of operating that protects it from these tendencies or accusations of the same. This would mean more government regulation; and we do not like such regulation. My own judgment is that private management can develop ways of protecting itself adequately from these tendencies; and that it is highly important that it do so.

Another difficulty is illustrated by our experience with the chain

stores. They introduced some important economies and efficiencies at the start. The savings, however, went too largely into profits and not enough into lower consumer prices. As a result, competing chain store systems developed everywhere, and forms of competitive expenditures developed, even including restoration in some cases of the services of the independent stores, and the decline in costs was not only checked, but in general reversed. The supermarkets may be having a similar hsitory.

The chain stores had the advantage at the start not only of an integrated system of buying and selling, but of supplying to the masses of workingmen's families only those services along with the groceries that these families could afford to pay for. The chain stores tended presently to lose sight of this second advantage, and to want to sell more services with their goods as so to attract a larger number of customers, and this raised their costs.

* * *

Something more specific needs to be said about the integration of production and consumption. A perfectly functioning market would take care of this completely. Because it does not, we have "surpluses" of all kinds. What is a *surplus?* It is simply a quantity of a product which, for any reason whatever, fails to move through the channels of trade. In our markets as they are, several kinds of surpluses arise—*seasonal*, as of milk in the summer months; *weather*, arising from unexpectedly large crops; *cyclical*, arising from the decline of consumption in business depressions; and *chronic*, arising from over-expansion of and over-investment in some line of production, with consequent persistence in producing more than the market will take. Some major developments in economic organization and functioning are going to be needed to prevent such surpluses, or take care of them if and when they arise. No doubt government will need to take a hand in these developments. Let us hope that the problem can be met without compulsory production or marketing quotas, export restrictions and the like.

* * *

In the years not far ahead, we shall have not only all the kinds of surpluses that we have just described, but in addition a general over-all surplus of farm products arising from the decline of exports with recovery from the war in Europe. To handle these adequately will call for integration, *plus* disposal outside the usual channels of

trade through such forms of supplementary food distribution as school feeding, distribution among needy mothers and children, institutional feeding, in-plant feeding, and stamp plans of one form or another. All of these will be much more effective if the production and the consumption can be fitted together, with the consumption in the main directed especially toward dairy, poultry and other livestock products that use much land and labor per food unit; also if the movement of the food after it is produced can be rationalized. Analyses which some of us have been making indicate that as little as a 3-percent increase in food consumption induced in this way will cause a 10-percent increase in food prices. Once we have developed this form of supplementary food distribution we shall find that we wish to keep them for use in handling the types of surpluses that arise in more normal times, and in improving the health of our people at the same time.

* * *

Let no one understand from the foregoing analysis of the marketing problem that efforts directed toward helping farmers with grading and standardization of their products are not highly worth while. These are in fact a necessary part of integration. So are good market inspection and market news services.

* * *

In the burst of emphasis on marketing following World War I, many studies were made of marketing costs. They helped virtually none. Will marketing costs studies help now? Only if they point the way toward reduction of costs of some operation of a cooperative or its equivalent; or toward some achievement in integration. Costs in marketing, it must always be remembered, reflect prices as much as prices reflect costs. The surest way of raising the average cost of distributing milk in a city, it has been demonstrated, is to raise the distributor's margin by one cent per quart. If something doesn't happen quickly to reduce present retail food prices and margins, we will be saddled with a higher level of retail costs that not even a major depression will wholly do away with.

* * *

One could outline other types of efforts that will be important aids toward making marketing more efficient. All of them together, however, will add up to little unless they contribute importantly

to better integration. If we are to achieve for the farmer in the next ten years the goal of 50 cents, or 55 cents, or even more, out of the consumers' food dollar—and this we must do or the new drive on marketing we are now starting will go the way of the last—we can do it only by two developments—much better integration in our marketing system, and effective forms of supplementary food distribution. It is these that should receive our major attention now.

In conclusion, I must warn you that developments of these two types call for a higher order of economic insight and analysis than marketing problems have too often received; and that the translating into action of the findings of such analysis calls for a higher order of economic statesmanship than the marketing extensionists of the past, agricultural or other, have often possessed.

RESEARCH IN ECONOMICS OF FARM PRODUCTION

WALTER W. WILCOX*
University of Wisconsin

FARM Management workers have benefited from time to time by professional papers and committee reports on research methods.[1] Current developments in the availability of secondary data and a continually widening demand for facts relating to the economics of farm production suggest the value of another paper in this field. Fully as important, recent developments in economic theory and statistics as yet have had little application in farm management research.

As well trained young men become available again in the next few years, increased emphasis must be placed on improvement in research methods and on more critical selection of research projects. New economic production problems are arising as a result of changes in technology and readjustments from war time conditions. With so many economic problems unanswered, we can ill afford to continue to use a large part of our farm management research resources "to prove that George Warren was right, back in 1911."[2]

Current Demand for Farm Management Data

In contrast to the early days in farm management research when interest centered primarily on the factors which influence finanical success in farming, these relationships have now been well established. Today the influence of high crop yields, efficient livestock, size of business and power and labor costs on net farm income are well known. The influence of the productivity class of the land also

* The author is especially indebted to Earl O. Heady of Iowa State College, F. F. Hill of Cornell University and to a number of colleagues in several States and the Bureau of Agricultural Economics for reading an earlier draft and offering criticisms and suggestions which have been incorporated in this paper.

[1] The more important of these are Social Science Research Bulletins 13 and 52, *Scope and Method in Farm Management Research* and *Farm Management Research 1940–41; Theory of the Farm and Farm Management Research*, T. W. Schultz, this JOURNAL, August, 1939, Sherman E. Johnson, *Recent Trends in Farm Management*, U.S.D.A., B.A.E. mimeo. March, 1941; *Forty Years of Farm Cost Accounting Records, Forty Years of Farm Management Surveys* and *Thirty Years of Farm Financial and Production Records in Illinois* by Andrew Boss, S. W. Warren and M. L. Mosher, this JOURNAL, February, 1945. In this paper the terms "farm management" and "economics of farm production" are used interchangeably.

[2] Several workers, some within the field of farm management and some in related fields, in recent months have expressed regret to the writer that such a large proportion of the farm management research merely proves the correctness of the farm management principles developed by Professor George F. Warren of Cornell University.

is well established. Each year, however, thousands of farm records continue to be analyzed from this point of view to obtain up-to-date extension and resident teaching materials.

In addition to this demand for up-to-date farm management extension materials, farmers, extension specialists and farm leaders are continually seeking information on the economy of new production techniques and new resource combinations. Work of this character could easily utilize more men than are currently engaged in farm management research.

But farm leaders today have still another group of questions that only farm management data and analyses can answer. These refer to the effect on the use of agricultural resources of alternative government policies in the field of farm price supports, crop insurance, production controls, soil conservation and international trade. Another group of questions come from consumers and representatives of other occupational groups whose interests center primarily on production costs and incomes received by farm families in relation to their food prices and their own incomes.

Secondary Data Now Available for Descriptive Studies

Farm management research methods need a critical examination and reorientation today primarily because of this widening demand for data on the economics of farm production and farm family incomes. But fully as important, improvements and additions to the secondary data available permit a great economy of effort and increase in scope of the research results with the available farm management personnel.

Improvements in the agricultural census and in the availability of data on individual farms permits special farm classifications of census data never before available. Cooperation between the Bureau of Agricultural Economics and the Bureau of the Census has now reached the stage that the essential descriptive information on number of farms of particlar sizes and types in an area and the average acres of crops, numbers of livestock, value of products sold and production expenses can be obtained from the 1945 census.[3] The utilization of such data permits an orientation of spe-

[3] Professor Hill of Cornell University points out that the usefulness of census data for descriptive studies in New York are limited because of the need for segregating hill and valley farms in most areas of the state. At the present time, the data obtained on each individual farm by the census are not sufficiently comprehensive to permit such a classification. This shortcoming of census data is equally important in a number of other sections of the United States.

cial researches undertaken in a way which results in a much wider and more accurate application of the conclusions than has been possible in the past. In fact, the general orientation of each particular group of farms studied with respect to a generally accepted scheme of farm classification would meet the criticism of farm management studies made by Schultz in 1939 when he said " . . . they afford no way of relating the actions taken within the farm to that of the economy as a whole."[4]

One of the major proposals of this paper grows out of this availability of secondary data and experience to date in its use in the farm management field. The writer proposes that each state should analyze its farm management projects to determine the extent to which each one is aimed at description and the extent to which each is aimed at analyses of specific problem situations. When this is done consider the extent to which the needs for descriptive information could be met by the use of secondary data.[5]

Census data could be analyzed on a large scale to provide more adequate descriptions of the farming prevailing in a given area. It is doubtful, however, whether additional descriptive studies utilizing only data available in the census meets the needs of people interested in the economics of farm production. Rather, census data may be used as the basis for determining the average farm organization for particular types and sizes of farms to which additional farm management information may be related. Utilizing techniques already worked out in the BAE and in some states, a body of information on production, income, and expense on farms of specified types and sizes can be accumulated at relatively low cost.

Studies of this type, which have been under way in the Division of Farm Management and Costs for several years, are especially useful in providing information on current enterprise organization income levels of farm families and trends in costs, labor efficiency, and levels of living on particular kinds of farms.[6] These annual

[4] *Op. cit.*, Schultz, p. 570.

[5] A farm management extension specialist, in commenting on an earlier draft of this paper, said, "In extension we could use to advantage more good descriptive information as well as better analyses . . . . I would like to see this [descriptive] work expanded to give us better descriptions of different types of farms with perhaps two or three size classifications. If this could be done, I think Extension could discontinue much of the work of making annual farm record summaries which at present require far too much of our farm management extension workers time."

[6] The most recent summary of this work is found in the processed BAE report F.M. 55, *Typical Family-Operated Farms, 1930–45—adjustments, costs and returns, April 1946*. A similar cooperative study between the BAE and a state is sum-

farm budgets prepared for farms of specified sizes and types may also be used in forward-looking analyses, testing out desirable production adjustments in view of prospective price and technological changes. Alternative government price support, marketing allotment or production adjustment programs might also be tested out with respect to their adaptability to these specific farming situations. The procedure in such studies utilizes secondary data to the maximum and draws on all relevant farm management analyses for information on labor, power, and other physical requirements for specific enterprises on the group of farms under study.

The expansion of enumerative surveys by the Bureau of Agricultural Economics opens up further possibilities for keeping up to date on trends in resource use, farm practices, costs, production, income, and size of farm in the larger geographic areas with a minimum of additional special farm management studies.[7] Enumerative surveys also offer an opportunity for obtaining basic data on specific enterprises in particular kinds of farming, such as soybeans on livestock farms. All too frequently farm management workers look upon their job entirely in terms of gathering and analyzing their own primary data. This situation must be corrected in view of the large amount of excellent secondary data now becoming available. Farm management workers could well give more time and thought to the improvement and expansion of enumerative surveys as a means of obtaining more adequate samples of much basic farm management data.

A Suggested Research Program

The content of a well rounded research program was outlined in *Social Science Research Bulletin 52*. In this publication four major areas were outlined: (1) A description of prevailing farming sys-

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marized in *Economic Information for Wisconsin Farmers*, Jan.–Feb. 1945, under the title, "Production, Income and Expense on Typical Farms in Wisconsin, 1935–43."

[7] The enumerative sampling work of the BAE started with 2800 farms in 1946. The extent to which this work will be expanded depends on administrative problems encountered in carrying on the field work and in summarizing and interpreting the data and on the Congressional appropriation of funds for such work. In January, 1947, 16,000 farms were enumerated. The entire United States sample is carefully selected by objective sampling methods. Each farm or a sub-sample will be visited 4 times during the year, when present plans materialize. The schedules contain the usual questions asked by the Crop and Livestock Reporting Service and additional information on expenses, income, farm practices, farm population, household facilities, and other data needed by the research Divisions of the BAE.

tems and measurement of current changes in farming, (2) Detailed analyses of farm management problems by size, type, location and other factors, (3) Economic effects of institutional and technological changes on agricultural production, (4) Explorations in new fields and development of research methodology.

Few states have adequate resources to carry on a substantial research program in all these areas at the same time. It is not the purpose of this paper to attempt a restatement of the content of a comprehensive program for states with ample research budgets. It is rather to point out what appears to be the more essential minimum lines of work within states having limited budgets and possible areas of cooperation between state and BAE personnel.

Taking into account the three factors, (1) the existing body of farm management knowledge (2) the availability of secondary data and (3) the wide general interest in the economics of farm production, the writer suggests the following minimum state farm management research program:

1. Studies of costs and returns on important sizes and types of farms within the state.
2. A limited number of farm accounts or other records for use in determining why some farmers make higher incomes than others, and practices followed by the more progressive farmers.
3. Analytical studies of problem situations.

Studies of costs and returns on the important sizes and types of farms should have a high priority in every state. In the period of readjustment in farm prices, production, and costs which is ahead, there will be a great deal of interest in adjustments made in these items on the more important sizes and types of farms in each state. Information of this nature for the more important kinds of farming in each state would be highly useful in supplementing BAE estimates of gross farm income and production expenses on a state and national basis. Such data could also be used for teaching and other general utility purposes for which accounting data or old surveys are utilized at the present time. These studies would yield data of general descriptive character more generally useful than farm record summaries.

Analyses of why some farmers made higher incomes than others and of the practices of the higher income farmers would still require farm accounts or some similar records. For these and related pur-

poses it appears desirable to use a small part of even a limited research budget to join with the Extension Service and a cooperating group of farmers in the summary and analysis of their annual accounts. In order that such resources yield the greatest return, it would be desirable to limit the use of research funds to situations where groups of farmers are sufficiently interested to hire a field man who will help them in keeping and interpreting complete and accurate records and in improving their farming operations. Some of the greatest research values will be found in the information obtained informally from the better farmers in the state who will be members of such a cooperative group. In addition to the usual extension uses of these account summaries they should be used by the research staff as a source of case studies showing the results of particular enterprise combinations and production practices.

In areas where farm management associations with substantial membership fees cannot be organized because of the low level of farm family incomes, periodic surveys will be needed. If the descriptive information on such areas is reasonably adequate, these surveys might well be limited to a study of the organization and practices on the more successful and progressive farmers in the area.

These two types of projects might well be the continuing work in each state which would provide a fund of current farm management information with respect to the typical or average and the better than average farming situation. While it is impossible to set up desirable budgets in the abstract, it is indeed a "poor" state which must use over half its farm management resources in providing this necessary up-to-date descriptive teaching material.

With the facilities which the BAE have for working with census data and for integrating the studies in areas which cross state boundary lines, each state could well have a major cooperative project with the BAE for studying costs and returns on specific sizes and types of farms. To the extent that BAE resources are available for work with states such projects might well have priority until an adequate job is completed in each state.

Field studies are needed in many areas to obtain input-output data applicable to specific farm situations. They also are needed to check the reliability of estimates made from secondary data. For the most part, however, the studies of costs and returns on specific sizes and types of farms can be completed from secondary

data now available and the information on what the better framers are doing can be obtained as a byproduct of Extension farm account projects.

In the midwest states at least, there is more danger of having too many rather than too few farm account records to summarize and study for research purposes.[8] The writer looks with favor on the organization of Farm Management Associations which will pay a large part of the cost of summarizing and analyzing the annual accounting records. Under such conditions an association including a number of the better farmers in each major type of farming area would appear to be a desirable goal. This is particularly true when one considers the Extension as well as the research benefits from these associations. It is hoped that as farming continues to become more business-like that large numbers of these farm management associations will be organized on a fully self-supporting financial basis.

The third line of work, studies of problem situations, is particularly in need of expansion. If workers in the field of farm management or economics of farm production are to contribute new information in contrast to restating established generalizations in a different setting, they must undertake new analytical studies of problem situations. Secondary data can and should be utilized to provide the general background for these analytical studies. But for the most part, the research worker will require additional primary data bearing directly on his problem. These data must then be analyzed with the use of up-to-date statistical techniques. Each state might well study its farm management research program to determine how many of the projects can be classified under this heading of analysis of specific problem situations. Recognizing that an adequate descriptive background is essential for teaching and general utilitarian purposes, the higher the proportion of the budget devoted to well defined analytical studies, the higher rating the total research program merits.

The problems which form the subject matter of these analytical

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[8] This statement is based on the observation that few groups of farm account records are sufficiently detailed and representative for most investigations of problem situations. Too much research time is spent computing the same averages year after year from farm accounts. The writer is not in a position to pass judgment on the desirable number of farm accounts in a farm management extension program.

studies will vary by geographic areas and from year to year. In the South at the present time problems in the field of developing farm organizations to utilize effectively the new machinery and other improved technology available are considered of paramount importance. Resource combination problems growing out of the adoption of soil conservation practices are of primary importance in many areas. Changes in demand associated with postwar readjustments may create the critical problem situations in other cases.

Weaknesses in Current Research Methods

Farm income results from a combination of such a large number of variables that few economic studies of farm production permit valid generalizations for specific situations or geographic areas. All too often the results of a study are reported as "A Farm Management Study in Brown County, 1946" or some similar title. The data analyzed are those furnished by a group of farmers interested in keeping accounts or survey data for a township or some other community which in the judgment of the investigators is representative of the county or some other geographic area. *Because of the heterogeneity among the farms and the number of variables affecting net farm income,* the study seldom goes farther than to show by means of cross classification the relation between labor income and size of business, crop yields, etc.

Enterprise studies all too often do not go beyond the point of computing averages for the entire group of farms studied or the average physical requirements for the group having the highest costs in contrast to the average for those having the lowest costs. Most studies of specific enterprises using farm account records, such as fattening beef cattle, group the records on the basis of results obtained and show the amount of different kinds of feed fed and other cost items for the group with the highest and the group with the lowest return over feed cost per hundred pounds or per animal. Even in this small part of the total farming operation, the limited number of records available and the large number of variables usually prevent quantitative generalizations regarding the relationships involved. The data merely show that the men who made the greatest profits on their fattening cattle obtained the greatest gains per 100 pounds of feed fed and similar relationships. *The question of the critical differences in resource combinations and management*

practices which led to these widely different results is seldom, if ever, answered with statistical evidence.

The sorting of enterprise data on the basis of returns over the more important costs has been found to be a very useful extension teaching device. Its usefulness, however, in large part results from the use of these comparisons by the farmer and the fieldman or Extension Specialist working with him to determine where additional study is desirable. If the farmer finds he is in the low group in the comparison the specialist discusses with him possible changes in practices in the light of results obtained in various trials at the agricultural experiment stations. Practices followed by the farmers who obtained the highest returns on the enterprise, may be suggested by the specialist who knows all the farmers included in the study quite intimately.

Difficulties in establishing quantitative relationships under farm conditions arise in large part from the number of variables involved in most studies undertaken. Some research workers have advocated the use of block samples "limited to an area which is homogeneous as to soil, climate, topography, and markets," in the study of relationships.[9] As a matter of fact, however, there are few blocks of land in the United States as large as a township, which are sufficiently homogeneous in soils, topography, farm organization and farm size to permit quantitative economic generalizations regarding resource use relationships. Usually these intensive farm management studies of selected geographic areas or blocks result in a restatement of generally accepted generalizations for this particular block—not in new generalizations with respect to quantitative relationships which are true for some larger universe.

Warren is correct in stressing the difference in the sampling problem in descriptive or "counting" in contrast to analytical studies. While the two types of studies can be combined, a sample drawn for one purpose may be an inefficient, if not an inadequate, sample for the other purpose. It is a rather common misconception that objective sampling for studies of efficiency relationships in farm production is unimportant. Few efficiency studies result in new quantitative generalizations primarily because the project was not planned on an adequate statistical basis. In the words of a reviewer of an earlier draft of this paper, "Warren was correct in pointing

[9] S. W. Warren, *Forty Years of Farm Management Surveys*, this JOURNAL, Feb. 1945, pp. 21–22.

out that one may need different samples for mere counting of an item and for determining relationships. Yet to get the correct relationship, one still needs an *unbiased* sample over the whole range of the data." It is obvious that one cannot be sure that a few geographic blocks selected by the investigator will be such a sample.[10]

Steps in Improved Methodology

Farm Management workers could save a great deal of time and expense if they would state their research problems in terms of questions within specific frames of reference, whether they are internal farm organization problems growing out of technological or price changes or the measurement of the effect of government policies on the use of resources. When the questions are carefully worked out, a review should be made of the technical information already available bearing on the answers to these questions. On the basis of existing information, hypotheses can be formulated with respect to expected technical relationships in the problem situation to be investigated.[11]

A second step involves reviewing the economic principles and empirical studies which apply to this particular problem situation. What hypotheses of economic relationships appear most promising in view of existing economic theory and previous studies of similar situations? When these two steps have been completed, we are ready for the third step. This consists of defining the limits of the universe to be studied and the determination of the size and a feasible method of obtaining an objective sample.

Analytical studies of problem situations designed to establish new quantitative generalizations between resource uses on individual farms and costs or income require some form of farm classification. Area classifications while useful for some purposes usually are far too heterogeneous to permit meaningful generalizations for all the farms contained within them. An important aspect of the research is the determination of the particular classification of farms which is most useful in both arriving at and interpreting the results of the study. While complete uniformity in criteria used in classify-

[10] Unless, of course, one only wishes to generalize for those particular geographic blocks.

[11] Conversely, statistical results obtained should be tested against available knowledge of technical relationships and their accuracy rigorously verified if they contradict experimental results. (Some recent publications apparently have not done this.)

ing farms cannot be expected among the different investigators, adherence to a general basic plan of farm classification will add greatly to usefulness of the results.

The preparation and testing of the schedule of questions to be asked and the selection of the statistical methods to be used in analyzing the data also are an essential part of the third step. Most recent texts on statistical methods give an adequate treatment of the appropriate procedures for preparing and testing questionnaires. If before field work is undertaken, research workers will go through the three steps mentioned above, there is a high probability that the research undertaking will be successful.

All Studies Need Not Be Statistical

Thus far the discussion has assumed that all farm management research involves statistical analysis. In farm management a high proportion of the research must be quantitative in character. But further work is needed in examining and restating economic theory as it relates to the firm and to cost curves to make it more useful in farm management analysis. Current studies at Wisconsin raise doubts about a number of the basic assumptions underlying the average cost and marginal cost analyses as applied to the usual farm management decisions.

A further qualification is pertinent. Well trained and experienced research men may be able to analyze problem situations in non-quantitative terms and arrive at valid and exceedingly useful conclusions even though they have no statistical proof of their conclusions. They may then present case studies or sample data to illustrate their conclusions.[12] This is a highly useful type of research if the investigator exercises sufficient caution to avoid incorrect conclusions. But to be useful the conclusions must be stated in sufficiently specific terms to permit and facilitate their application (a characteristic often found lacking).

Farm Management men also have a large field of service in working with research workers in the technical fields, assisting them in

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[12] A large number of the farm management bulletins present tabular data to show (or prove) the existence of relationships when the application of appropriate statistical tests would show there was no statistically valid basis for such inference. At most the data could only be used to illustrate the relation if the investigator had other means of convincing the reader that such a relation between the two variables did in fact exist. In such cases the reader should be told that the data are presented for illustrative purposes only.

planning and analyzing their experiments to obtain results which can be interpreted in economic terms. Continued use of budget analyses in forward-looking studies of new resource combinations involving technological processes not yet adopted by farmers is another valuable type of research.

There no doubt are other aspects of the field of Farm Management research which have been slighted in this short discussion. This paper has served its function, however, if it has stimulated some thinking and planning with respect to improvement in research methods. Farm Management workers often lament the large gap which exists between the level of efficiency possible on farms and common farm practices. The gap is just as wide in our own profession.

If we will use the secondary data now becoming available in increasing quantities; if we segregate more sharply our descriptive and our analytical studies; if we increase the proportion of our resources utilized for analyses of problem situations; and if we apply the more recent developments in economic theory and statistics in the analysis of these problems, great progress can be made in farm management research.

HOW EFFICIENT IS AMERICAN AGRICULTURE?*

THEODORE W. SCHULTZ
The University of Chicago

AS MORE attention is given to high policy for agriculture one can detect a growing awareness of two major economic difficulties that affect agriculture adversely, namely its inefficiency in a long run setting and its instability in a short run context.[1] This approach is clearly evident in the report of the "Colmer Committee" in its *Post-War Agricultural Policies* (House Report No. 2728, 79th Congress, 2d Session), the Land-Grant report on *Post-War Agricultural Policy* and in recent statements issued by the U. S. Department of Agriculture. As yet, however, neither of these problems has been adequately formulated. The reasons are several, but chief among them is the fact that each has been viewed mainly as a series of particular maladjustments within agriculture and not as general economic problems that have their origin primarily in the economic instability and development of the non-agricultural sectors of the economy.[2] Moreover little is known about the magnitudes of either the allocative inefficiency or the aggregate instability of agriculture. Nor has anyone undertaken a straightforward inquiry to determine: How efficient and how stable is agriculture? Economic thinking on these issues has not gotten down to anything approaching economic characteristics and basic causes. This is clearly evident when it comes to the existing economic inefficiency of agriculture where the stock remedy consists of more technological gadgets and better farm management. A more serious analytical obstacle arises from the fact that the more articulate sectors of agriculture—those that actually predominate in agricultural economics—are strongly wedded to the erroneous presupposition that

* In revising this paper I have benefited from the critical comments of Louis J. Ducoff, Ronald W. Jones, and Glen T. Barton.

[1] This leaves aside a third major problem often in the foreground also, that is the inequality of incomes.

[2] *Agriculture in an Unstable Economy*, McGraw-Hill, 1945, is based on this formulation, J. S. Davis' review of my book in *Review of Economic Statistics*, May, 1947, represents, so I interpret it, a comprehensive dissent from this identification of two primary economic difficulties confronting American agriculture. My note published along with Davis' review is an attempt to state concisely the differences in presuppositions to help clarify the basic issues in the belief that this will facilitate further analytical work on these matters by others.

American agriculture is by and large quite efficient.[3] This belief blinds the great majority of professional workers. Should not this belief be challenged?

The main thesis of this paper may be put as follows: *The agriculture of the United States is far from efficient when tested against economic criteria.* It will suffice to demonstrate the extent of this inefficiency, leaving the matter of underlying causes for another occasion and for others to untangle. To further indicate the limits of this paper it may be noted that it is merely part of a more extensive inquiry into inefficiency and instability affecting agriculture.[4]

I

The belief is widely held that farming in the United States has no peer. It has all the necessary earmarks—it is apparently advanced, modern and progressive. It has tractors, combines and cornpickers; hybrid corn, disease resistant wheat and new varieties of cotton; artificial insemination of cattle, cross breeding of hogs, and in terms of nutrition our livestock are better fed than are our people. With these advances, and many more, American agriculture, it is said, leads them all. It is out ahead presumably because of the flood of new methods and improved techniques developed by our Agricultural Experiment Stations and disseminated by the far-flung Agricultural Extension Services. If this is not enough to make American agriculture efficient, all that can possibly be lacking is the more general adoption of these techniques and methods. When that is achieved, so the prevailing belief goes, American agriculture cannot be other than highly efficient; more efficient than farmers elsewhere and fully as efficient as producers in other fields. This point of view has been further strengthened during the war just passed by the remarkable capacity of farmers to produce more food and feed despite wartime difficulties and a large shrinkage in the farm population.

[3] There is of course an easy way out and that is to ascribe enough non-monetary utility to each farming area to always compensate exactly for any difference in the value productivity between the human effort employed in a given farming area compared to that of other occupations. The procedure is really very simple: if (a million) farm families product only $600 per year in terms of products consumed, traded, and marketed and the "equilibrium" value productivity for comparable human effort elsewhere in our economy is $2,000 annually, simply add in $1,400 for these intangibles and a fine balance is struck "proving" that a benevolent factor equilibrium between agriculture and other sectors of the economy prevails! If any methodological doubts should arise, it is of course convenient to say that no one can tell how much these non-monetary utilities are worth.

[4] Growing out of the research planning of a Faculty Exploratory Group at the University of Chicago.

The achievements in production of agriculture notwithstanding, and though students from all parts of the world come to this country to study and benefit from our accomplishments, farming in the United States taken as a whole does not come anywhere near meeting the standard of efficiency set by the American economy.[5] Instead it has all the earmarks of being highly inefficient, falling far behind most other major industries. How much inefficiency has become embedded in agriculture is a disputed point. Few agricultural economists, however, would contend for even a moment that a full-time family farm, under pre-war price and cost conditions, producing a value of product of less than $600 was anything other than inefficient. Yet the 1940 census identified well over a million such farms.[6]

A few studies are available that provide a clew to the existing situation. Before turning to these, however, it should be noted that regardless of the state of the arts an optimum utilization of resources is a desired goal.[7] Waste, consisting chiefly of human effort

[5] The concept of efficiency is applicable to different input-output relationships depending upon the conditions set by the problem. In a certain "technical" setting it may be employed to determine, for example, how to produce the most *corn* on an *acre of land* regardless of the cost of the inputs, the objective being to find the combination of inputs that produce the largest yield of corn and this would represent "maximum efficiency" in such a context. In farm management it may be used to determine, for instance, how to produce the most *profit* on *a farm* with the assets at the disposal of the farmer and with the prices of inputs and outputs given. The combination of resources that would achieve this goal would, under given conditions, represent "maximum efficiency." Still another formulation, the one underlying this paper, has as its goal the task of determining how to produce (achieve) the largest *social product* in *the economy* as a whole given the existing cost and utility patterns. When all resources in the economy are allocated so that no further gain can be achieved by an additional transfer of a factor or product from one use to another use, "maximum economic efficiency" is achieved. This would represent the *ideal*, the general equilibrium of economic analysis.

Throughout this paper the concepts of "efficiency" and "inefficiency" are in terms of economy, namely the third of these formulations thus going beyond farm management where prices of inputs and outputs are taken as given. The main focus of this paper is upon *factor disequilibria* that are causing widespread economic inefficiency in the American economy and affecting adversely especially farming in the United States.

[6] This figure presumably leaves aside part-time farms, rural residences and semi-retired operators.

[7] Alec L. Macfie in *Economic Efficiency and Social Welfare*, Oxford University Press, 1943, presses the argument that efficiency is not merely an instrumental value but that it has the main characteristics of moral value. He starts by identifying efficiency with economy, " . . . if we develop economy into a realistic definition we find that it is only another word for efficiency. Economy in a negative sense is the process of avoiding waste. More positively, it is the process of making the most out of scarce resources" (p. 105). Then, after putting efficiency to a series of tests to see if it has the characteristic of other primary moral values, he concludes his Chapter VI, "We can and ought to consider efficiency in the same way, with the

in the case of agriculture, should be avoided whether the existing technology is primitive or highly developed. Moreover, it is not only possible but necessary to abstract from both the state of the arts and the state of management in order to get at those aspects of economic efficiency under discussion. To put this another way, given the existing technology and management, are we achieving even approximately an optimum utilization of resources? It is, of course, true that better management on the part of individual farmers with regard to the resources at their command, and the adoption of better methods and techniques can increase substantially the output of land, capital, and of human agents. In this paper, however, the focus is not upon techniques or management but upon the lack of economic efficiency that arises from a malallocation of resources among industries and among firms independent of technology and enterprise. Moreover, it will become evident that the rapid advances in agricultural techniques, and possibly also in management, under existing demand and population conditions, have contributed in no small measure to the relatively low economic efficiency characteristic of so much of the agriculture of the United States.[8]

II

To turn now to the studies referred to above, four types of evidence are at hand. The first deals with the ouptut per worker of one part of agriculture relative to other parts; the second, with some differences in productivity between agriculture and industry; the next with some international comparisons; and the last with the marginal productivity of labor and capital in agriculture.

1. *Differences within agriculture.* It is convenient to start with the assumption that the more efficient farming areas in agriculture utilize the resources they employ about as well as do most nonagricultural industries. This assumption implies that relative to industry no significant malallocation of resources exists in the more efficient areas in agriculture; and, therefore, comparable inputs result in outputs of about equal value in industry and in the more

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same methods and relative to the same standards, as we do any other human virtues . . . . In this sense, efficiency is of the same stuff as the other values, and so is commensurable with them . . . ." pp. 129–130.

[8] See my *Agriculture in an Unstable Economy*, McGraw-Hill, 1945, Chap. III, and "Changes in Economic Structure Affecting American Agriculture," this JOURNAL, Vol. 28, February, 1946.

efficient farming areas. Given this assumption, we leave aside for the time being the question of whether a disparity of resource utilization prevails between industry and the best in agriculture and concern ourselves solely with the situation within agriculture broadly considered. Ducoff and Hagood have done excellent pioneering work on this point, and so have Barton and Cooper.[9] Ducoff and Hagood ascertained the regional differences in labor productivity in agriculture on a gross and a net value basis taking 1939 output and "a man-equivalent" unit to measure the labor inputs.[10] Barton and Cooper calculated the gross farm production per worker for the years 1919 to 1944.

The facts that emerge in these studies certainly do not support the existing folklore regarding the much vaunted efficiency of American agriculture, provided we look at agriculture as a whole and not at a few selected farms. The figures are indeed devastating in their sweep and force, yet they have not received nearly the attention they deserve from serious students of agricultural economics.[11]

The West emerges as the most efficient, having an output per man—equivalent 2.5 times as large as that of the South. To put this in terms of 1939 production as reported by the 1940 census, it means that the value of products per man-equivalent in the West was about $1500 compared to about $600 in the South. The following table is based on Ducoff and Hagood:

Region	Value of product per man-equivalent[a]		Value added by agricultural production process per man-equivalent[b]	
	(In dollars)	(Relative to Pacific)	(In dollars)	(Relative to Pacific)
Pacific	1,558	100	1,409	100
Mountain	1,423	91	1,204	85
W. N. Central	1,286	83	1,135	81
New England	1,244	80	950	67
E. N. Central	1,197	77	1,112	79
Middle Atlantic	1,129	72	952	68
W. S. Central	700	45	716	51
South Atlantic	608	39	583	41
E. S. Central	486	31	493	35

[a] The total value of agricultural products is that reported by the 1940 Census of Agriculture and it does not include Government payments to farmers.

[b] Total value of agricultural production (adjusted to the Bureau of Agricultural Economics level and to include Government payments) less the following operating

expenses: feed purchased, livestock purchased, fertilizer and lime, cost of operating motor vehicles, and a group of miscellaneous expenses consisting of such items as seed, insecticides, containers, electricity for production, twine, ginning, operating gas and steam engines, irrigation, grazing, miscellaneous dairy supplies, blacksmith and miscellaneous hardware supplies, etc.

D. Gale Johnson in "Contributions to Price Policy . . . ," this JOURNAL, Nov. 1944, p. 642, has a table giving estimates of the net farm income per worker for 1939, 1940 and 1941 expressed as an index. In it the New England region drops from fourth to sixth place, the Mountain region from second to fourth, while the W. N. Central rises to second and the E. N. Central to third. This index ranges from 335 for the Pacific and 265 for W. N. Central to 120 for South Atlantic and 100 for E. S. Central.

RELATIVE OUTPUT PER WORKER WITHIN AGRICULTURE IN THE UNITED STATES
(Pacific Region = 100)

Region	1929[a]	1937–1940[b]	1939[c]	1942–1944[b]
Pacific	100	100	100	100
West North Central	99	87	81	111
Mountain	99	84	85	95
East North Central	70	83	79	89
Middle Atlantic	68	73	68	71
New England	57	60	67	64
West South Central	50	43	51	45
South Alantic	44	37	41	39
East South Central	36	31	35	34
United States		59		66

[a] From Colin Clark, *The Economics of 1960*, Macmillan, 1943, p. 35. Clark's absolute figures are in terms of an International unit and as follows starting with the Pacific, 1102; 1092; 1086, 772, 691, 628, 546, 490, and 394 for East South Central, and are based on earlier work of Professor John D. Black.

[b] From Glen T. Barton and Martin R. Cooper, calculated from unpublished data.

[c] From Ducoff and Hagood. See earlier reference. The 1942–44 relationships are included to show that even under conditions approaching full employment the major regional disparities in output per worker in agriculture are fully evident. I am mindful, however, that these data omit the "unemployment" of hired workers, often of considerable importance in some regions, especially in parts of the West, while they may include this factor in the case of croppers and others.

[9] Louis J. Ducoff and Margaret Jarman Hagood. "Differentials in Productivity and in Farm Income of Agricultural Workers by Size of Enterprise and by Regions," U.S.D.A., Bur. of Agr. Econ. Aug. 1944, 54 p. (mimeo.) Glen T. Barton and Martin R. Cooper. *Farm Production in War and Peace*, U.S.D.A., Bur. of Agr. Econ., Dec. 1945, mimeo. FM 53.

[10] The man-equivalent unit used by Ducoff and Hagood "represents an approximation to the labor time input and work capacity of the average farm operator who is under 65 years of age and does not work off the farm in excess of 100 days per year." This estimate was developed to allow for the regional differences in time input, physical capacity, and skills of the labor force in agriculture. See page 3, especially footnote 4 and Appendix, pp. 36–38.

[11] It is to be regretted that studies of so much merit should be buried in a casual mimeographed release. Furthermore, other writers have made only the most cursory reference to the many broad implications to efficiency inherent in Tables 1–7, in Ducoff and Hagood and Table 29 in Barton and Cooper.

These wide differences in output embedded in agriculture are not at variance with common knowledge. The cost of this mass inefficiency is not known; nor are the causes well understood, much less the remedies consistent with a "free" society; nevertheless, the fact that the disparities in value productivity are very considerable is generally known. But little is being done to lessen the waste of resources associated with this inefficiency. Rather than break the cake of custom these inefficiencies are "viewed" as natural. It is easy to take satisfaction in the few areas and farms that are relatively efficient and let pride blind us to the cost of the rest.[12]

A word or two on the probable magnitudes involved may be helpful at this stage. Less than one-tenth of the farms in the United States are situated in the West; one-half of them are in the South. The data that follow are also from Ducoff and Hagood based on 1940 Census:

Area	Number of farms (in millions)	Output per worker rating[a]
West (Pacific and Mountain)	.5	1.00
North (West N.C.; New England; East N.C.; and Middle Atlantic)	2.6	.70 to .85
South (West S.C.; South Atlantic; and, East S.C.)	3.0	.30 to .45

[a] This rating is merely with regard to differences in output within agriculture. It does not identify and isolate the contributions to production attributable to labor from that attributable to other factors, that is to capital including land. Plainly the bundle of cooperating factors used with labor in the more productive areas is much larger than it is in the South. The capital investment per farm worker in 1939, as computed by Ducoff and Hagood, was $7,211 and $6,243 in the Pacific and Mountain areas respectively and down at $1,958 and $1,887 in the South Atlantic and East South Central.

Still another formulation of the mass inefficiency in agriculture is at hand if we take all classified farms and put them into two categories as follows:

Value of product per farm	Farms[a]		Labor force in percent	Value of product per man-equivalent in dollars	Total agricultural output in percent
	Number in millions	Percent			
Up to 1,499	4.6	77	65.6	82 to 837	32.5
1,500 & over	1.4	23	34.4	1,087 to 2,850	67.5

Source: Ducoff and Hagood, *op. cit.* Footnote to table at bottom of page 651.

What these figures suggest is that about two-thirds of the labor

force in farming in the United States before the war was exceedingly unproductive. Farm people in this large group for the most part work hard and long but their output has relatively little value; they are underemployed; these human resources are poorly utilized.[13] This widespread inefficiency is not some temporary situation, a New Deal emergency or a cyclical depression, but a development of long standing with one part of agriculture, a small part in terms of the total labor force, relative efficiency and the rest, far down the scale not even half as productive.

2. *Agriculture relative to industry.* Let us now examine the assumption made earlier to the effect that the better areas in agriculture utilize resources about as efficiently as industry. If the value of products from comparable inputs were essentially equal, this assumption would be valid and no inducement would exist for resources to transfer either from industry into such farming areas or conversely. No farming area of importance, except perhaps the Pacific during the war, has during recent decades induced labor resources to enter; instead, the net transfer seems to have been all

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[12] A few years ago a group of agricultural experts visited this country. They were cordially assisted. After they had finished their trips to see our agricultural colleges and farms, a meeting with some of the U.S.D.A. experts was arranged. One of the visitors opened by remarking, "Your published statistics indicate that about 1.5 million of your 6 million farms have tractors. Are these figures correct?" He was assured that such were the facts. Whereupon he sagely observed, "Where are the 4.5 million farms without tractors? We have been in every major region but we have not seen a farm without a tractor."

[13] Ducoff and Hagood put it thus: "Thus when an allowance for types of workers in the several value classes is made, the level of worker productivity on low-income farms is still so low in contrast with that of the higher value classes that the conclusion is inescapable that a tremendous amount of under-employment and ineffective employment existed on the farms in 1939." *Op. cit.*, p. 8. Here again, I am mindful of the fact that the whole economy was running in low gear, several million workers were unemployed and that this "unemployment" is mainly omitted and that this omission affects the two groups differently. But a cursory examination of the data for 1946 indicates that the main relationships herein considered were still present.

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[a] These data obviously have their limitations. The Census does not identify neatly and exactly economic magnitudes; it does not set out to ascertain the value productivity of human effort devoted to farming. Accordingly, the Census definition of a farm includes many part-time, semi-retired and rural residences. The column "value of product per man-equivalent in dollars," from Ducoff and Hagood, does correct for some of these limitations. Yet in part they persist. It would, however, be shortsighted indeed to become so engrossed with the shortcomings and the details of these data to fail to see the broad outlines of the problem of mass inefficiency embedded in our farming. Better data are, of course, needed but what is much more important is a formulation of the problem in some general economic context so that we can go beyond description to analysis, beyond figures to policy.

in the other direction, namely out of farming even under wartime price conditions, which were obviously exceedingly favorable to farming. There is, therefore, a strong presumption that even the more efficient parts of agriculture have not been as productive as have other industries.[14]

If we take the value added by manufacture and compare it with the value added by the agricultural production process, we find that in the West in 1939 manufacture added 2.5 times as much per worker as did agriculture. A gap as wide as this does not support the assumption of equality in output for comparable resources, granted that other important considerations are involved. In the South Atlantic and the East South Central areas this gap is even more striking with manufacture adding more than four times as much value per worker as agriculture. The following data on this point are taken from Ducoff and Hagood.[15]

Areas	Value added by the agricultural production process per man-equivalent	Value added by manufacture per employee	Ratio of value added by manufacture to value added by agriculture[a]
Pacific	1,409	3,222	2.3
Mountain	1,204	3,372	2.8
West North Central	1,135	3,084	2.7
East North Central	1,112	3,094	2.8
Middle Atlantic	952	2,862	3.0
New England	950	2,261	2.4
West South Central	716	2,754	3.8
South Atlantic	583	2,092	3.6
East South Central	493	2,122	4.3
United States	867	2,762	3.2

[a] These differences between farm and non-farm focusing on the use of labor resources are reflected in regional disparities in wages and incomes. The median wages and salaries income of male laborers working 12 months in 1939 were as follows:[b]

Area	Farm (dollars)	Non-farm (dollars)	Farm as percent of non-farm
West	646	1,196	54
Northeast	496	1,145	43
North Central	348	1,093	32
South	262	649	40

[b] Louis J. Ducoff, *Wages of Agricultural Labor in the United States.* Tech. Bul. No. 895, July 1945, U.S.D.A., p. 95.

That industry at this stage of our economic development is in general more productive than agriculture is not commonly understood. Beliefs on this point are mixed. In the main, the misuse of resources that this entails goes unnoticed. The low income of most farm people over the years is not usually attributed to a fundamental malallocation of resources among primary, secondary, and tertiary industries, but to shortcomings of the market mechanism (which, of course, has its limitations), to not having enough technological knowledge, to a misuse of our natural resources, and to the selfish interest of other economic groups of society. Meanwhile, the basic causes for these wide disparities in productivity per head and in earnings per worker within agriculture are overlooked.

3. *International comparisons.* On theoretical grounds and from observations it is evident that the general level of productivity of labor in the United States ranks high among the countries of the world. This simply means that the comparative advantage of the human factor is relatively high; it is high because human effort has a large value productivity and its value productivity is large because of the exceedingly favorable combination of cooperating factors. This high level of productivity in turn means high income per head. Accordingly, the level of income of a country may be taken as a rough index of the relative economic efficiency of the human factor in a country.

Colin Clark gives the average real income per head of various countries in terms of an international unit over the period 1925–34. His calculations put the top ten countries as follows: United States, 1381; Canada, 1337; New Zealand, 1202; Great Britain; 1069; Switzerland, 1018; Australia, 980; Netherlands, 855; Eire, 707; France, 684; and Denmark, 680.[16]

On the assumption that Clark's income figures provide us with a rough measure of the comparative advantage of the human factor

[14] Walter W. Wilcox in "The Wartime Use of Manpower on Farms," this JOURNAL, August 1946, shows a decrease in the farm population, 1940 to 1945, of 12.5 percent for the Pacific area and 19.1 percent for the Mountain area, while the decline for the South Atlantic was 15.9 percent and for the East South Central 18.8. Wilcox includes some figures showing the decrease in farm employment, 1939 to 1945 annual averages, which show a drop of 8 percent for the United States as a whole with one region running counter to the stream and this in fact the most efficient area, namely, the Pacific with an increase of 3 percent.

[15] Based on Table 3, p. 20, of the Ducoff and Hagood mimeographed report already cited.

[16] Colin Clark, *The Conditions of Economic Progress.* London: Macmillan, 1940, p. 41.

in these countries, we would expect the output per head to be such that the value productivity of agriculture in the United States would be, if anything, slightly higher than that of New Zealand, and Australia, for example. The opposite, however, seems to be true. When we take the overall value productivity of agriculture, New Zealand and Australia produce about twice as much per head as we do in the United States. Denmark affords another comparison where the general level of output per head is about half that of the United States, and yet the agriculture of Denmark appears to produce virtually as much output per person as does farming in the United States. The following figures with regard to the average real production of agriculture per male producer are from Colin Clark's two recent books:

Country or area	Productivity per male producer (in terms of Colin Clark's International Unit)[a]
New Zealand	2,444
Australia	1,524
Argentina	1,233
Pacific (area)	1,102
West North Central (area)	1,092
Mountain (area)	1,082
Uruguay	1,000
East North Central (area)	772
Middle Atlantic (area)	691
United States	661
Denmark	642
New England (area)	628
Canada	618
Holland	579
West South Central (area)	546
Germany	490
South Atlantic (area)	490
Great Britain	475
Switzerland	433
France	415
East South Central (area)	394
Belgium	394
Czechoslovakia	287
Estonia	268

[a] From Colin Clark *The Conditions of Economic Progress*, London: Macmillan, 1940, p. 246, and *The Economics of 1960*, p. 35.

L. Rostas in a recent report[17] places the productivity of labor in British and American agriculture before the war at £159 and $584

[17] L. Rostas, "Productivity of Labour in British, American and German Agriculture," *Royal Economic Society*. Memo. No. 107. Sept. 1946. Pp. 14–17.

respectively. Taking the exchange rate at $3.52, the value productivity of labor in agriculture in these two countries turns out to be about the same. This fact, namely, that the agriculture of the United States is no more productive than that of the United Kingdom, in Rostas' mind, goes a long way in explaining why it was that the standard of living in the U. K. was not substantially below that then prevailing in the United States at a time when the manufacturing industry in the United States produced about twice as much per person as it did in the U. K.

These fragmentary data indicate that the economic efficiency of agriculture in the United States is far below par, with par in this context being the standard set by the general level of production per head, which is indeed high.

It follows that the output in agriculture should also be correspondingly high and it would be if resources were properly allocated between agriculture and other fields within the economy. If the economic efficiency of human effort in agriculture were comparable to the productivity of labor in general in the United States it should have an output at least 25 to 50 percent above that of agriculture in western Europe. But what do we observe? American agriculture as a whole is no more productive than it is in the U. K., according to Rostas' study. In fact, half of the farms of this country appear to fall far below the U. K., Denmark, Holland, and the agriculture of other countries of western Europe. One has to go to the very backward agriculture of eastern Europe to find productivity as low as it is on fully half of the farms of the United States.

4. *Marginal productivity of resources employed in farming.* Economic theory makes equal marginal returns for comparable factors the test of economic efficiency. Economy is achieved when this criterion is met. Little indeed has been done to identify and ascertain the marginal productivity of the factors employed in agriculture, a necessary and preliminary step to the application of this crucial economic test.[18]

D. Gale Johnson[19,20] has carried forward some work in this

[18] See the section of my paper "Income Accounting to Guide Production and Welfare Policies," dealing with allocative efficiency. *Western Farm Economics Association Proceedings*, 1945.

[19] "Contribution of Price Policy to the Income and Resource Problems in Agriculture," this JOURNAL, Vol. XXVI, No. 4, Nov. 1944.

[20] Earl O. Heady in "Production Functions from a Random Sample of Farms," this JOURNAL, Vol. 28, Nov. 1946, reports results he has obtained for Iowa farms for the year 1939. His study, unlike that of Gerhard Tintner and O. H. Brownlee, "Production Functions Derived From Farm Records," this JOURNAL, Vol. 26,

sphere. He found that in 1939 the marginal productivity of capital employed in agriculture, taking American agriculture as a whole, appeared to be about 12 percent, and that for labor about $390. He goes on to point out that a "reduction of 20 percent in the labor supply would reduce the marginal productivity of capital from 12 percent to a little less than 10 percent." Accordingly, even then the differential return between the rate of interest and the marginal productivity of capital would remain very wide. Johnson has unpublished data that show the marginal returns on capital in Georgia to have been about 19 percent in 1939, while in Iowa the returns appear to have been about 10 percent.[21] The marginal efficiency of capital in much of agriculture is higher than the going rate of interest even with liberal allowance for risk and uncertainty. Contrarywise, the marginal efficiency of labor is far below the going rate of comparable labor in other fields even with generous allowance for the cost of migration and the risk and uncertainty this entails, viewing the economy as a whole.[22]

These four bits of evidence all point to the same conclusion: American agriculture by and large is very inefficient. It does not approach the standard of economic efficiency set by the American economy. Although some parts of agriculture show up fairly well, the general level may be 25 to 50 percent below par; and major parts, fully half of all farms, may fall below the 50 percent level. To put this tentative characterization another way: it suggests that more than half of the labor force devoted to farming has an output (value productivity) less than half the standard output of comparable human resources in the American economy taken as a whole. This simply means that resources—human effort, land, and capital—are poorly utilized in much of agriculture. The evidence that we have cited suggests that the waste is prodigious, waste chiefly of time and energy of millions of farm people and of a vast amount of natural resources. Three economic afflictions, each of

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August, 1944, deals with farms that are a cross-section of farming in Iowa. It is, however, a *within Iowa* analysis and thus pertains to a section of American agriculture most nearly efficient in the allocation of resources generally. This observation should not detract from the merits of the technique of analysis. The results, although interesting and useful within Iowa, give no clue to the general problem of achieving an optimum utilization of resources within the economy as a whole.

[21] See also Ducoff and Hagood, *op. cit.*, Table 3 on value added by the agricultural production process per $100 fixed capital investment.

[22] See my *Agriculture in an Unstable Economy*. New York: McGraw-Hill, 1945, p. 78 and Chapter IV.

them chronic and of long standing, may be identified in agriculture as a result: (*1*) *under-employment of human resources,* (*2*) *an unwarranted disinvestment of natural resources,* (*3*) *a widespread rationing of capital.*

III

It certainly is not my contention that the facts cited are conclusive. They do, however, give an inkling of what we may find when more serious studies of economic efficiency of American agriculture are undertaken. Much needs to be done to identify and measure the relative productivity of the various resources devoted to farming, relative to the output of comparable resources in other fields.

Yet it must be borne in mind that this endeavor is merely a preliminary step and we should guard against the pitfall of making it an end in itself. The main task is to ascertain the causes for this adverse development. What broad forces—economic, political, and cultural, and each in their institutional setting—are fundamentally responsible for this vast waste of resources in farming? Why is the United States in contrast, for example, with New Zealand and Australia, so generally afflicted with resource malallocations as between industry and agriculture? In short, what are the root causes for the mass inefficiency of our agriculture?

Until we achieve a rationale that gives a valid explanation for this development, we will be ill-equipped for forging appropriate remedies.

In this context, agriculture in most advanced Western countries has become a depressed industry. Why do the primary industries—mining, farming, fishing, and the like—become depressed? To penetrate into this problem which is spreading ever farther among primary industries we need above all a basic economic rationale, a theory that tells us why most primary industries become depressed.

The premiums for inquiry in this sphere should be large because the problem is so significant and its solution so vital to a better performance of our economy. Yet little in fact is being done to analyze this complex and important issue.

It may be well to reiterate that farm technology and farm management will not provide either the theory or the facts for analyzing and resolving the problem of mass-inefficiency characteristic of our agriculture at this state of our economic development. It is quite

plausible that this widespread economic inefficiency would not have arisen in Western countries had the Ricardian conditions prevailed, that is, had the supply function of food stayed highly inelastic, so inflexible in fact that as population increased and as economic progress occurred in non-agricultural branches, it would have been necessary to transfer relatively more capital and labor into agriculture in order to produce the larger quantity of food required.[23] Advances in farm technology and in the state of farm management, however, have been responsible for avoiding the Ricardian consequences: an avoidance of the higher cost of food, rising rents, and a progressive enrichment of the land owners as population pressed against the means of subsistence. In forestalling this dismal development, technology and management has made possible cheaper food, and falling rents, and have rendered a great many farmers superfluous, so it appears.

It may well be that one of the main causes for the economic inefficiency of agriculture in Western countries is to be found in the very advances in farm technology and the researches that have made this possible, coupled with the forward strides that have been made in farm management as it is now conceived and applied.

[23] Such a development would of course have restricted the economic progress of the non-agricultural sectors of the economy.

ECONOMICS OF FARM LEASING SYSTEMS*

EARL O. HEADY
Iowa State College

AN IMPORTANT part of the nation's agricultural resources is employed on farms operated under some one of the various leasing arrangements. Nearly one-half of our farms obtain control of part or all of their resources by this means. Because of the quantity of resources so controlled, the farm lease stands on a level with other important phenomenon which condition the efficiency with which food and fiber are produced. It is a known fact that rental payments are determined by a maze of forces which in addition to competition include custom and elements of bilateral monopoly. Obviously, lease terms so determined may have varying effects upon the organization of resources on individual farms.

Over a period of years farm leasing arrangements have been subjected to a sizeable amount of investigation. A large portion of this effort has, however, been devoted to describing the common leasing system and the one of these which best fits the situation peculiar to individual landlords and tenants.[1] Since each farm situation is unique in itself, the specialist who expects to improve leasing arrangements through advice retailed to tenants or landlords might well use the theoretically perfect lease as his point of departure. Yet the theory of leasing systems and customs has never been fully developed.

This paper has as an objective the further economic analysis of known leasing customs. In part it is a refinement of previous work, but it also analyzes other leasing customs which are known to exist and which have mainly been described The method followed is that of setting forth the economic characteristics of perfect leasing systems, comparing known customs with these standards and suggesting the means whereby the perfect lease would eliminate imperfections which now exist. This procedure is based on the assumptions that (1) no drastic change in the amount of tenancy will come

* Journal Paper No. J-1020 of the Iowa Agricultural Experiment Station, Ames, Iowa. Project No. 976.

The suggestions of I. W. Arthur, Ross Bauman, Raymond Beneke, and Virgil Hurlburt have been very helpful.

[1] Ackerman ("Status and Appraisal of Research in Farm Tenancy," this JOURNAL, Vol. 23, Feb. 1941, p. 283) brings out this point and suggests that lease studies should be directed toward isolation of factors which produce undesirable effects.

about in the near future and therefore leasing will continue to be an important factor conditioning use of resources, (2) some amount of public resources will continue to be invested in advising tenants and landlords, and (3) the theoretically perfect lease may often serve better than existing customs in pointing the direction of improvement. Although somewhat abstract in nature the discussion can be looked upon as the analytical setting for additional empirical investigations. The study focuses on leasing systems per se and their effect on the organization of resources on the individual farm. It is not concerned with the sociological or legal aspects of tenancy. Neither is it concerned with the relative values which society attaches to alternative forms of tenure, social wastes which arise outside the farm business, or the problem of personal income distribution as such.

Perfect Leasing Systems

In setting forth the characteristics of perfect leasing systems or in analyzing existing customs, it is necessary to delineate the economic setting within which the evaluation is to take place. For the purpose of the analysis presented here, the following are taken as given: (1) competition, except for imperfections growing out of leasing systems, and the private ownership of resources, prevails and (2) the pricing system is looked upon as the appropriate means for expression of consumer preference and hence for allocation of resources in the most efficient manner.[2] A perfect leasing system must thus result in (1) the most efficient organization of resources on the farm relative to consumer demand as expressed in market prices and (2) an equitable division of the product among the owners of the various resources employed in production. Under the conditions which have been set out above, these are the appropriate criteria for evaluation of leasing systems. For the definitions of "efficient" and "equitable" which follow, attainment of one must result in the simultaneous attainment of the other. Distinction between the two is made only because this necessary condition need not hold true under the definitions of "equitable" used in certain instances.

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[2] It is recognized, of course, that perfect competition does not hold in a large part of our economy and also that the pricing system does not result in a most efficient allocation of resources even in agriculture. However, these assumptions are set forth in order to limit the scope of this study to leasing systems alone.

Equitable Division of Product

Under the institution of private resource ownership there can be, of course, only one definition of an "equitable" division of the product. The return to any one of the resource owners must be based on the marginal productivity of the resources which the individual contributes. His share of the total product is then established by the quantities of the various types of resources which he contributes to the firm and the marginal productivity of specific resources. The reasons why "equitable" cannot be defined otherwise in a setting of competition and private ownership of resources are elementary: (1) Unless the marginal value product is imputed as a reward to each factor, the most efficient allocation of resources cannot be attained.[3] (2) The institution of private resource ownership honors no other definition.[4]

Since in the long-run the most efficient allocation of resources cannot be attained without an "equitable" division of the product (as defined here) and vice versa, most of the analysis of this study will be in terms of the former. It must be emphasized, however, that this meaning of "equitable" does not refer to a situation in which it appears that each party receives an income in proportion to his contribution as an average for the entire business without regard to its various segments (a definition implied in a large num-

[3] Unless the firm pays a cost for the use of resources equal to their marginal productivity, the allocation of resources will not be in harmony with consumer preferences. Waste of resources will result because inefficient firms may be able to exist and especially because the wrong combination of products will be forthcoming. Even under public ownership of resources and an equal distribution in income, maximization of the social product would require that each individual firm pay a cost for the use of resources equal to their marginal productivity. For a complete discussion along the lines of the latter see O. Lange, and F. M. Taylor, *Economic Theory of Socialism*.

[4] This statement refers only to the sale of productive services by the individual resource owner. Many policies of this nation's government have obviously resulted in personal incomes greater than would hold true if the marginal value productivity of resources were determined in the market alone. The consequent distortion of returns on resources relative to consumer preferences has resulted in an inefficient use of resources. However, these policies have not sanctioned a charge other than the marginal value productivity (as determined by market prices and governmental policy) for the use of productive services sold by the individual to the firm. Although there may be scattered instances in which legislation has resulted in a charge for resources (sold by the individual to the firm) out of line with their marginal value productivity (as expressed by market prices alone or by price and governmental policy), there is little evidence that this was the original intent. Labor union activity, for example, has undoubtedly resulted in wage payments out of line with the marginal value productivity of labor in numerous instances. Yet the objective of the original labor legislation perhaps was that of bringing wage payments into line with the productivity of labor.

ber of lease publications). The importance of this point is brought out in a later part of this study.

Efficient Use of Resources

A test of the perfect leasing system is in its effect on the total product available to consumers. Resource and commodity prices should, in a perfect market, indicate the pattern of production and combination of resources which is most nearly consistent with a maximization of consumer satisfaction. Leasing systems should facilitate an organization of resources within the individual farm which will bring about this pattern. Any characteristics of a lease which violates the pricing system in this respect is imperfect. If at a given time, consumer satisfaction is to be maximized with a combination of products made up of X_A units of commodity A at price P_A and X_B units of B at price $P_{B'}$ an imperfection of the leasing system occurs if the resulting output includes less than X_A units of A or more than X_B units of B at prices higher or lower respectively than the otherwise equilibrium prices. Finally, the leasing system is imperfect if it does not encourage adoption of the most productive combination of resources in the production of a unit of a given commodity. If the stock of resources in the economy is great enough to allow the output of X_C of all commodities under the most efficient technique, any characteristic of a leasing system which results in adoption of another technique and a total output of less than X_C is undesirable.

Under competitive conditions, this maximum product can be forthcoming only if the firm has attained the necessary equilibrium conditions. Aside from other imperfections in the market these conditions are, in the long-run, simply those which are necessary for the maximization of profits by the individual firm. Accordingly, an appropriate methodological tool for evaluation of leasing systems is that of a firm acting rationally in respect to the maximization of profits from resources which it controls. The leasing system thus becomes imperfect if it hinders allocation of resources in the direction of these necessary conditions: (1) A combination of products (choice of enterprises) which will equate marginal returns on resources employed in production of each. (2) Substitution of factors (methods of production) such that the ratio of their marginal productivities is equal to the ratio of their prices. (3) Combination of variable with fixed resources (where resources are fixed by con-

ditions falling outside the leasing arrangement) such that marginal returns and costs for the former are equated. (4) An over-all scale of operations which equates marginal cost and returns at a level consistent with the cost price relationships and normal uncertainties of the market.[5] (These relationships must hold for all resources employed by the firm irrespective of ownership.)

Assuming that the firm has knowledge of alternative techniques and is able to formulate otherwise normal price expectations, a leasing system will result in an uneconomic organization of resources within the firm only if it contains a provision which results in some one of the following imperfect conditions.

Situation I: A fixed supply of specialized resources is established within the firm and input of these is not related to their marginal productivity. This inflexible supply of specialized resources may have various effects upon the use of resources within the firm: It may limit the over-all scale of operations in the sense that the firm cannot equate marginal costs and revenue at a level suggested by market prices. In the production of a given commodity it may also result in a substitution of other factors or methods for the specialized resources in a manner which violates the structure of resource prices. Where funds are limited and capital rationing has to be taken into account, a more important effect may be the allocation of resources between different products. This is illustrated in Figure 1 which assumes that two factors (A and B) are employed in the production of commodity X. The input of B is fixed for the firm. However, A can be varied in a manner such that returns are equated with those on other resources (C) which can be used in producing still other commodities (Y). The curve MS indicates the net marginal return which would be forthcoming on factor A if B were also varied. (A and B combined in optimum proportions but decreasing returns to scale).[6] The curve MR indicates net marginal returns on factor A when the quantity of B is held constant (variable proportions and sharply diminishing returns to B). The highest possible

[5] These conditions might be stated in several alternative ways. However, these four somewhat simplified conditions have been segregated since problems of leasing systems fall into these distinct categories. The last statement assumes that in the long run the scale of operations will approximate any optimum which might conceivably exist.

[6] The nature of the marginal returns curve shown might arise because of decreasing returns to scale in the classical sense or because of uncertainty and the discount of future returns. The exact explanation of the curve is unimportant for this section of the analysis.

returns on C resources is equal to ON. If factor B were not fixed, the firm would employ OQ units of A in the production of commodity X before any inputs of C were used in production of Y. However, when the supply of factor B is inflexible, resources are diverted to commodity Y as soon as OP units of A have been employed in production of X.

A fixed supply of resources tends to be created under the leasing custom wherein the landlord and tenant each furnishes specialized resources while the product is divided along parallel and equally rigid lines. Under the typical crop-share (or cash) lease the landlord furnishes the fixed assets in the form of land and buildings while

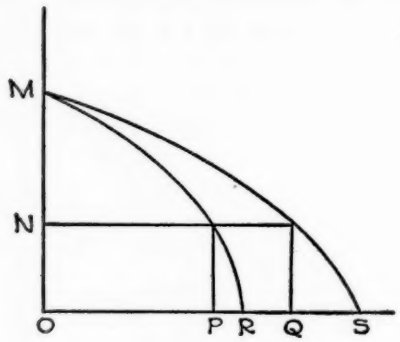

FIG. 1

the tenant furnishes all or a major part of the working capital. Often the kind and quantity of buildings found on a rented farm are those which existed when the landlord obtained title and hence are the result of the price-cost relationships of the past or the financial situation of previous owners. Input of these resources may not be extended even though the potential marginal return is greater than for other types of resources; since the landlord does not receive a direct share of the product he may be unwilling to add investment in buildings. This situation is implied in numerous leasing and tenure studies which have called attention to lack of buildings and other livestock facilities on rented farms. Schickele indicates that the landlord has no strong inducement for furnishing buildings beyond a minimum necessary to attract competent tenants under a crop-share lease since his share of the product comes not from the livestock but from the land.[7]

[7] Rainer Schickele, "Effect of Tenure Systems on Agricultural Efficiency," this JOURNAL, Vol. 23, February 1941.

In terms of the farm, this fixed supply of durable resources may have various effects: as Schickele suggests, it may curtail the overall scale of operations. It may also bring about inefficient production techniques such as, for example, the use of hand rather than machine-milking methods. The tenant, in the allocation of resources between enterprises, may provide his own brooder and produce poultry for meat in the event facilities for laying hens are lacking. A lack of facilities for dairying may turn his efforts in the direction of pork production. Or, his total investment in livestock maybe curtailed while additional capital is allocated to machinery and crop supplies. Yet the inefficient allocation of resources outlined above is not inherent in leasing systems. If this were true the only remedy would be a single owner of all resources (owner-operated farms and elimination of leases.[8] Decisions as to allocation of resources would then be divested in a single individual and marginal returns might be equated for all lines of investment. The inefficient use of resources arises, however, not because of leasing per se but because of the custom wherein a rigid demarcation is established between the types of resources and the product is not properly imputed to each. An appropriate method of eliminating this imperfection is obvious. The cause of the "rationing" needs to be abolished. A perfect leasing system would solve the problem by scrapping the rigid segregation of inputs and product shares by types of resources and by substituting the proper leasing provisions in its stead. There are at least two alternatives here. Under one the tenant would be allowed to furnish and realize the entire net return on the otherwise fixed resources. This implies compensation for unexhausted resources and is discussed in the following section.

The other alternative would also provide the proper flexibility in combination of resources; the landlord would not only furnish the durable resources but also would realize the net marginal return on the investment. In theory the lease needs to provide such a fine division of receipts that the true marginal return on buildings is imputed to the landlord and marginal returns are equated throughout the firm.

In a practical sense then, the lease should, among other things, provide for two distinct payments; one representing the return on the land and another as the return for other durable capital investments in buildings and equipment. A payment of the latter nature

[8] This means implied in some tenure studies.

is entirely justifiable and should be encouraged for systems of farming in which livestock is an integral part.[9] It is also appropriate in the case of granaries for storage or other durable resources which have a positive value productivity. The possibility of improving leasing arrangements through this means has been somewhat overlooked. This is evidenced by the emphasis which has been focused on compensation for unexhausted resources or farm ownership as a

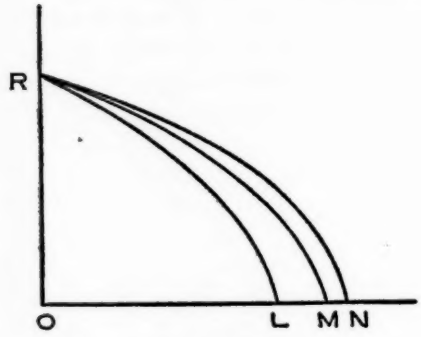

FIG. 2

solution to the evil. In the lack of legislation for compensation, improved use of resources might also be brought about by breaking down customs which do not allow the landlord the proper return on improvements and other durable investments.[10]

Situation II: Uncertainty is created beyond that which would normally exist in the market. If the lease creates uncertainty which would not otherwise exist, the outcome may well be of the nature illustrated in Figure 2. Net marginal returns are represented on the

[9] Obviously, this provision is not applicable for types of farming in which improvements play no part. The marginal return would be zero regardless of resource ownership in this case. Too, the discussion does not refer to a payment on a set of lavish improvements which are out of line with their productive value. It means only that "rent" is justifiable for the kinds and amounts of improvements which allow an approximate best use of resources for the farm as a unit.

[10] Under a share lease, part of this return is represented in the greater absolute product where livestock is kept and manure is applied to the land. The returns of this nature represent one component of the total return to the landlord for durable resources. It does not necessarily hold, however, that the entire marginal value productivity of buildings and similar improvements is so reflected. Were this true the investment in improvements would be greater on tenant-operated farms. Under a perfect leasing system, the returns to the landlord for investment in improvements should not be confounded with that for the land. The two should be kept distinct partly to prevent development of the undesirable custom described here but mainly to prevent a distortion of costs such as might arise under a crop-share lease. (See later discussion of costs and premiums under crop-share leases.)

vertical axis and input of resources (and the time span) on the horizontal axis. (This assumes that as more and more resources are employed by the firm, additional investment takes the form of resources transformed into product over correspondingly longer periods of time.) The line *RN* indicates the return expected under the most favorable techniques were the rates of transformation and the price relationships existing at the time of formulation of production plans to be realized. In the absence of uncertainty the firm would thus invest a quantity of resources equal to *ON*. Under normal market and technological uncertainties, however, future returns may be discounted (curve *RM*) and a quantity of resources equal to *OM* will be employed by the firm. If the lease attaches additional uncertainty to the individual firm, discounting of future returns will be even greater (curve *RL*) and investment of resources will be extended only to *OL*. If uncertainty is increased by a like degree for each enterprise, the only effect will be a curtailment in over-all scale of operations by the firm. If the degree of uncertainty created by the lease is not the same for all enterprises, however, the firm will tend to divert resources away from enterprises for which it is relatively great to those for which it is relatively less. (Future returns will be discounted more for the former than for the latter.)

In practice, uncertainty is created by the time span of the lease. For a lease which will definitely be terminated in one year, the return to the tenant on resources such as lime or fertilizer is diminished by the amount of the product to be expected in the second and subsequent years. Leases which extend beyond one year but which are subject to termination on short notice give rise to uncertainty which results in a high discount of the returns to be expected on resources which are transformed into product only over a period of several years. Tenant investment thus tends in the direction of resources which can be transformed into product in one season and for which the return is relatively certain. Instead of investing in lime, fertilizer, or seed for legume crops, he turns his investment in the direction of tractor fuel for more cash grain crops. Production of such livestock as hogs for which the production period is relatively short may be favored over dairying. Or, the method employed in production of a given type of livestock may be imperfect since more durable equipment would otherwise be curtailed because of the cost of moving tenant-owned equipment. In any event the allocation of resources within the business will

deviate from that which would occur were no uncertainty created by the leasing system.

This imperfection may be alleviated through (1) long-term contracts or (2) compensation for unexhausted resources. The specific advantages of these provisions have been discussed in detail elsewhere and in one sense need no further elucidation. However, two points are worthy of emphasis: First, the perfect leasing system would call for compensation greater than the cost of the resources; returns would be based on the productivity of the unexhausted portion. Otherwise investment will still be in favor of resources transformed within a season. The tenant with limited capital is not likely to invest in "lime," for which he will realize the original cost alone two years hence when he can invest in "hogs" which will return the original outlay plus the normal profit within the year. In a practical sense, compensation should cover not only the original outlay but also some return on the investment of the unexhausted portion of semi-durable resources (when the investment has a positive value productivity for subsequent operations).[11] Second, compensation for unexhausted improvements should not be looked upon as a perfect substitute for the provisions outlined in the preceding section. Compensation best applies to semi-durable resources such as lime or fertilizer under short-term leases while the latter is more nearly appropriate for buildings and other permanent improvements which require a large capital outlay and can be transformed into product only over a very long period. The most profitable organization on a given farm may call for a dairy enterprise and erection of a new barn. However, if the tenant has limited capital, he is unlikely to invest funds in a barn which will stand empty because he cannot then buy the cows even though he will receive compensation upon termination of the lease.

Situation III: The cost structure (or relationships of returns) within the firm is distorted through a bookkeeping transfer from one enterprise to another.[12] Resources are free to move between all segments of the business in this case, and the firm will attempt to maximize profits by equating marginal returns in each alternative.

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[11] See Marshall Harris. "A Suggested Adjustment in the Farm Tenancy System," this JOURNAL, Vol. 19, Nov. 1937.

[12] This differs from the case previously outlined in following respect: In 1 the proportion in which some resources must be combined is given, and distorted costs structure for others grows out of this fact. In 2 the distorted cost structure is given and the inefficient proportionment or resources is the result.

However, as long as it must adhere to the "bookkeeping" rather than the true cost structure, the resulting allocation of resources will again differ from that which would hold under an unrestricted system of prices. This outcome is illustrated diagrammatically in Figure 3. The true marginal costs for two commodities *A* and *B* are represented by mca_1 and mcb_1 respectively. On the basis of the true costs, resources will be allocated between the two commodities to give the output *OM* of both *A* and *B*. However, if a bookkeeping transfer of costs is effected from *A* to *B* as indicated by the marginal costs mca_2 and mcb_2, the allocation of resources (on the basis of the "bookkeeping" costs) will be such as to give outputs of *ON* and *OP* respectively. There are many examples of such cost transfers under farm leases. These are brought out in the next section.

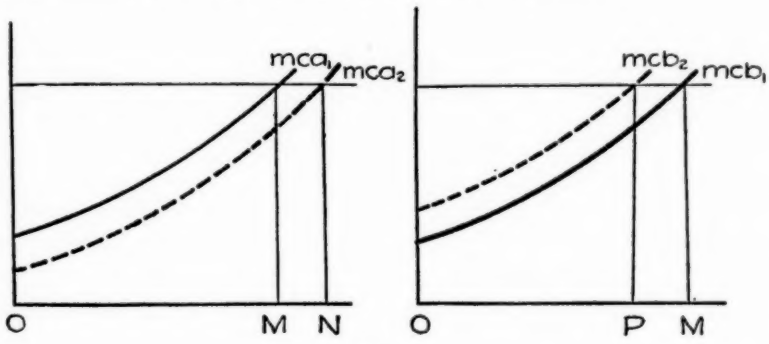

FIG. 3

Similar misallocations can take place within the firm even if bookkeeping transfers of costs do not take place. If the lease arrangement establishes a cost for some categories of resources (by custom or other arbitrary methods) either higher or lower than that representative of an unrestricted market, the distribution of resources between the various alternatives will not be in line with consumer preference as expressed in market prices: If the cost is lower (commodity *A* in Figure 1), too great a quantity of resources will be invested in production of the commodity. If the cost is higher (commodity *B* in Figure 1), too little of the product will be forthcoming.

Each of the common leasing systems may have somewhat unique effects upon the structure of cost and returns within the firm. Accordingly, each is treated separately in the following pages.

Straight Cash Lease

The straight cash lease provides that a definite sum be paid each year. The rent is thus a fixed cost and since it is not a function of output, the payment has no bearing on the firm's marginal cost for any unit of product. Assuming that it does not result in a fixed supply of specialized resources or creation of uncertainty aside from the market, the straight cash lease thus makes profitable the most efficient combination of fixed and variable resources. Since the firm pays the full marginal cost and receives the full marginal return, it will apply inputs of variable factors (lime, fertilizer, number of cultivations, improved seed rotation, etc.) to the fixed factor (acre of land) which will equate marginal revenue and marginal cost at an output (yield per acre) which reflects the most efficient combination of factors as given in market prices for resources and commodities.

Aside from uncertainty the cash lease also encourages the most efficient allocation of resources between alternative commodities within the firm. As a cost of using resources, the rent payment is not explicitly tied to any single enterprise. There is however, an implicit cost of using the leased resources for a given enterprise. This is in the nature of an opportunity cost and is dependent upon the transformation rates and the prices for the various alternative products. Allocation of resources between products should thus conform to consumer preferences as expressed in the market. This is in contrast to share leases for which rents are attached to individual commodities and tend to become inflexible over time with the consequence that costs within a firm may be distorted.

Allocation of resources between different enterprises may be imperfect, however, because of uncertainty and the degree of returns discounting growing out of the fixed payment. The fixed rent obligation has an effect akin to that of reducing the tenant's equity in his business. The firm operating under a cash lease stands a greater chance that its equity will be erased and bankruptcy will result if the price level drops by more than a given amount than will the one operating under a share lease. The firm can partially hedge against this eventuality through its selection of products. Since the probability of dispersion between expected and realized prices is less for the near future than for later dates, the operator will tend to select products (profits prospects otherwise favorable and even if the span of the lease creates no uncertainties) which will result in

the transformation of resources in the shortest possible period of time. By selecting commodities for which the production period is less than a year such as grain crops and hogs the hedge against insolvency is greater than if resources are invested in hay crops and roughage consuming livestock for which the transformation period extends over a longer period of time. To the extent that the cash lease places a premium on allocating resources in this direction society gets a different combination of products than would otherwise be forthcoming. This fixed rent payment may also have the effect of curtailing the over-all scale of operations. Since as the firm takes on additional liabilities, the probability that a price decline (or other unfavorable event) will result in bankruptcy becomes greater, it will tend to borrow less funds and employ fewer resources than would hold if the rent were not an explicit payment to be made at a later date.[13]

Improvement, if not perfection, of the cash lease may be brought about, however, through the modification suggested in the next paragraph.

Flexible Cash Lease

Under this leasing arrangement the amount of cash rent actually paid varies with the price level. The estimated rent (R_0) is established for the price level of a given year or base period (P_0). The rent actually paid in a given year (R_1) bears the same ratio to the base period rent as the price level of a given year (P_1) bears to that of the base period [$R_1 = R_0(P_1/P_0)$]. Although somewhat uncommon, the cash rent also can be varied on the basis of deviations of crop yields away from the average (deviations for a given geographic area than for an individual farm since in the latter case the lease becomes a simple crop-share lease). Although the cash rent paid varies with price and yield, it is not a function of output on the individual farm within a given year. Therefore, marginal costs are of a nature to allow the most efficient combination of variable and fixed resources. The flexible rent (both price and yield) does not have the same effect as the straight-cash lease in lowering the tenant's equity in the case of crop failure or price decline. Therefore, it should not place the same premium on selection of com-

[13] For a detailed discussion of the relation between increasing risk and the firms, declining equity, see M. Kalecki, *Essays in the Theory of Economic Fluctuations*, pp. 95–106.

modities for which the production period is short and for which prices can be forecast with a greater degree of accuracy. It should also be more favorable to a scale of operation consistent with the product and resources prices of the market.

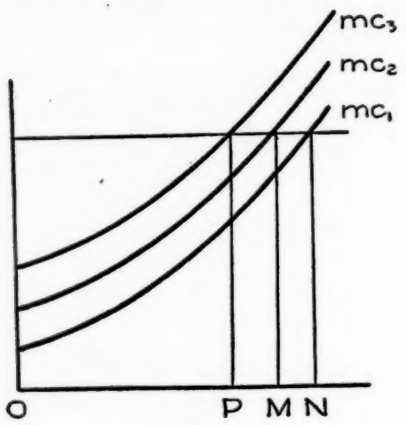

FIG. 4

Crop-share Lease

Under the crop-share arrangement a fixed proportion of the output is paid as rent on the land. (A variation of this lease is one in which a fixed share of the product is paid as rent for grain crops while cash rent is paid for the use of pasture and hay land. The several variations of this system of renting land are covered in this single discussion of crop-share leases.) The rent payment is a function of output and therefore represents a part of the marginal cost of any unit of product. An expected consequence of this form of lease is illustrated in Figure 4.[14] The marginal cost of obtaining different outputs per acre under a cash lease is represented by mc_1. The marginal cost for a one-half share lease is represented by mc_3. (It is equal to the marginal cost under the cash lease plus one-half the output if the share rent is considered as a cost for the use of resources.) Whereas the firm would apply variable factors (lime, fertilizer, number of cultivations, etc.) to fixed factor (acre of land) to obtain an output (yield per acre) of *ON* in the absence of a share rent, it will extend output only to *OP* under the one-half arrangement.

[14] See Schickele, *op. cit.*, for a similar analysis.

A survey of leasing publications indicates that there are wide variations in sharing of the cost of certain variable resources between tenants and landlord. In some instances fertilizer, seeds and similar supplies are paid by the landlord or tenant alone; in other cases the costs are shared.[15] Either the landlord or the tenant may find the application of lime or fertilizer unprofitable when he must bear the full cost. Or the same obstacle may be encountered for investments which the landlord alone is customarily expected to make. If the tiling of land results in a product worth $1.90 for each $1 input, the landlord will be unwilling to make the investment if the return must split with the tenant under a one-half share lease. Yet the imperfection is not inherent in the share characteristics of the lease. Instead, it grows out of the established customs as to method of sharing costs. A perfect share lease would provide the profit incentive for the most efficient combination of resources. Only one condition is necessary for a perfect lease in this respect. However, it is a complex provision. The cost of variable factors (where one factor such as land is fixed) must be divided between the landlord and tenant in the proportions that hold for the division of the product. Theoretically, a share lease in which landlord and tenant separately furnish single categories of resources and in turn realize a fixed share of product would approxmiate perfection in only one case. It is the appropriate arrangement only if the resources must be combined in fixed proportions. At any point a resource is combined with others in varying proportions, the cost of the variable factor should, under the perfect lease, be borne by landlord and tenant in proportion to the share of the product which each receives. In a practical sense, costs for inputs which are near the periphery of profitability for either tenant or landlord should always be divided in the same proportion as the product.[16]

Numerous customs have grown up around the crop share lease and tend to result in a transfer of costs between enterprises. One of

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[15] As an example of the apparent lack of systematic sharing of expenses, see George A. Pond, *Farm Tenancy in Minnesota*, Minnesota Agricultural Station Bul. 353, June, 1941.

[16] Some landlords furnish all of the fertilizer, lime, and similar materials. Obviously, they are willing to do this only in instances where their share of the expected returns is greater than the full cost. More landlords as well as tenants might be willing to invest in these improvements if costs were shared in a rational manner. Even though the landlord's (or tenant's) share of the product is greater than the full cost, the return on the resources concerned will be distorted relative to the return on still other resources.

these is the tendency toward uniform rental shares over wide areas.[17] Beneke, for example, found no significant relationship between share rentals and crop yields over heterogeneous soil areas in Iowa.[18] Some contend that uniform rentals over areas of varying productivity have no important effect on the equitableness of the lease or the efficiency with which resources are used since (1) if the share rents for the better land underestimate the true economic rent, the difference can be and is made up by higher cash rent and on hay and pasture, or (2) higher share rents on less productive land include not only a payment for use of productive resources but also a payment for rent on consumer's goods in the form of a house and other living facilities. In the Iowa study cited previously, a significant cash premium on hay and pasture was found to exist. This arrangement effects a bookkeeping transfer of costs from grain to hay and pasture crops (Situation III).[19] Accordingly, more grain (and grain-produced livestock products) and less forage (and forage-produced livestock products) will be forthcoming at a given time that would hold if resources were allocated strictly in accordance to the pricing system. This cost transfer has even greater implications over a period of time since forage crops play an important part in the conservation of soil resources.

The practice of including a premium for the use of living facilities in the share rent for less productive land is in itself undesirable. This is illustrated by Figure 4. The line mc_2 represents the marginal cost for land on which a one-fourth share approximates the true economic rent. However, a share rent of one-half (mc_3) is estab-

[17] It is common knowledge, of course, that share rents vary between certain wide areas. Even then, the discrete breaks in share rentals between broad regions cannot conform accurately to the gradual decline in economic rent resulting from increased transportation costs or less favorable weather. However, numerous studies have indicated that uniform rental shares tend to exist within areas which are fairly homogeneous in respect to prices and weather but widely heterogeneous in respect to soil resources.

[18] Raymond Beneke, *Economic Analysis of Crop Share Leases in Iowa*, unpublished M.S. Thesis, 1945. Other studies also suggest that custom plays an important role in establishing share rentals at some customary level. For example, see E. J. Englehorn, *Landlord-Tenant Relationships in Southern Iowa*, Iowa Agr. Exp. Sta. Bul. 372; G. G. Lambrecht, and F. Miller, *Farm Tenancy in Box Butte County, Nebraska*, Nebr. Agr. Exp. Sta. Bul. 336, 1942; R. Schickele, and M. Underwood,. "Better Tenancy and Less Of It," *Iowa Farm Economics*, September 1941; Studies in some states indicate relationship between rental rates and yields, but even then the yields vary fairly widely although within a given share group.

[19] Other studies also indicate that the premium resulting from competition for land or buildings often is expressed through higher cash rents on hay or pasture. For example, see I. W. Arthur, "Which Farm Lease Shall I Use?," *Iowa Farm Economist*, July 1944.

lished to include a premium for living facilities. Whereas the operator would employ variable factors (fertilizer, etc.) per unit of fixed factor (land) to obtain an output (yield) of *ON* under the one-fourth share lease, he will find it unprofitable to extend output beyond *OP* under a one-half share.[20]

A similar premium is sometimes charged for special housing facilities or outstanding improvements on highly productive land. The premium here may take the form of higher than normal cash rents on hay or pasture (share rent held constant at the customary rate). This again represents a bookkeeping transfer of costs from the household to the firm and less hay and pasture may be expected.

Under the perfect lease, any special premium to be exacted from the tenant for use of buildings should take the form of a flat payment per annum. As a fixed cost it does not alter the structure of marginal cost within the firm and consequently encourages the most efficient resource allocation. In any event a strict demarcation should be maintained between payments for the use of consumer goods and productive resources. Again the imperfections outlined are not inherent in the crop-share lease but grow out of special customs that develop around the lease. The perfect crop-share lease would correct these through maintenance of the true cost structure for individual enterprises within the firm.

Livestock-share lease. Although there are numerous variations, the most common lease under this system of farm operation includes the following provisions: The landlord furnishes the real estate, the tenant furnishes the labor, power, and machinery and each bears the expenses directly related to his resources; each furnishes one-half the investment in productive livestock, feeds and stands the same relative share of the operating costs. The receipts are divided on a 50–50 basis (or other fixed proportion) for the business as a unit and ordinarily without regard to individual enterprise (except perhaps for poultry). This system has certain advantages over others in respect to efficient use of resources. The very nature of the lease tends to eliminate some of the imperfections which have been

[20] Many other instances in which custom has resulted in a bookkeeping transfer of costs between enterprises could be cited. In an earlier paragraph it was noted that investment in tiling to the extent of $1 may be unprofitable if the landlord must split the added product of $1.90 with the tenant under a one-half share rent. He may, however, attempt to regain the product so imputed to the tenant by charging a higher payment on hay land rented for cash. The expected outcome is again that of Situation III.

discussed: (1) The tenure is ordinarily for a longer period. Uncertainty thus tends to be less. (2) The division of marginal costs and returns for such semi-durable resources as fertilizer and lime is of a nature to make the optimum combination of resources profitable for a given crop. Landlord and tenant each receive one-half the return and split costs in the same manner. (3) There is less tendency for rationing of durable resources. The landlord receives the marginal return on buildings direct in the form of a share of the livestock. In addition the role of the landlord in the contract makes available a still greater quantity of capital because (a) his funds are used and (b) credit institutions may loan more to the tenant because of the presence of the landlord in the operations.

This lease is sometimes looked upon more nearly as a business partnership than are other leases. However, the return imputed to either the tenant's or landlord's resources can properly be looked upon as the cost of these resources to the firm when considered from the standpoint of either party separately. Although this system of leasing has characteristics which facilitate efficient use of resources, an equitable division of the product or the best use of resources is not always inherent in typical arrangements. In reality, this is an over-all lease which results as a livestock lease is superimposed on a modified crop-share lease. Thus the over-all lease is inequitable in any instance when the crop-share component is out of line.

There are reasons why a livestock-share lease might not result in a perfect allocation of resources within the firm. Ordinarily the receipts are divided in fixed proportions for the business as a whole without regard to individual enterprises. When there is more than one enterprise and the combination of inputs differs between enterprises, this arrangement may again have the effect of distorting the structure of costs within the firm. This is illustrated by the hypothetical data of the Table. Columns 1 and 2 show the dollar quantities of resources actually transformed into product (column 6) and furnished by the tenant and landlord respectively. (The total resources transformed is equal to the value of the product and while allowing "normal" returns does not result in any "pure" profits). The contribution of each party and the division of product for the business as a whole are parallel. Under the somewhat common definition this arrangement would be considered equitable; each party is rewarded in proportion to his contribution to the business as a whole. However, the arrangement distorts the structure of

costs within the firm. (Column 2 can be considered the true cost of the landlord's resources from the standpoint of the tenant or column 1 is the true cost of tenant's resource to the landlord. The bookkeeping cost of the landlord's resources to the tenant is represented by column 3.) From the standpoint of the tenant, the bookkeeping system results in a cost transfer of $300 from enterprise *A* to *C*. (The opposite holds when the farm is considered from the landlord's viewpoint.) (Enterprise *B* is not affected since the division of input and output coincides with that for the business as a whole). What are the expected effects of this cost transfer on the organization of resources? Perhaps the provisions of the lease freeze resources so that neither the tenant or landlord can shift the farm organization. Yet the tenant will be prone to expand or improve enterprise *C* and contract *A*. The landlord may attempt to divert resources in the opposite direction.

It is of course true that many decisions are made jointly under the livestock-share lease. However, an imperfect allocation of resources may still result. If the number of tenants is greater than the number of farms available for rent, one would expect the organization under a livestock-share lease to be in the direction of dairy or other enterprises for which labor requirements are high.[21] A tenant with the upper hand might push for a beef cattle enterprise since the landlord's contribution (land) is relatively great. Even though the two parties have agreed upon a given organization, the tenant still has some flexibility; he can divert a disproportionate amount of labor and care to those enterprises for which he stands to gain relatively more from increased efficiency. Deviation from the typical is not uncommon under the livestock-share leases. The receipts for a dairy farm may be divided 50–50, but the landlord may furnish part of the machinery to offset the tenant's disproportionate contribution in the form of labor. Yet the arrangement still represents a bookkeeping transfer of costs from one enterprise to another. Even if the organization is fixed in respect to cow numbers or crop acres, it may still be more profitable for the tenant to allocate his resources such as to increase his efficiency in "crop" production relative to that in "dairy" production.

[21] That the livestock organization under the stock-share lease leans in the direction of dairy cows or feeder cattle, for which the contribution of resources by the tenant is relatively great, is indicated in the following study. Paul A. Taylor, *Organization of Iowa Farms Operated Under the Stock-Share Lease*, Unpublished M.S. Thesis, Ames, Iowa, 1932.

Enterprise	Value of resources furnished by			Percent of resources furnished by		Total product	Product "paid" to landlord	
	Tenant	Landlord	Total	Tenant	Landlord		Percent	Dollars
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A	300	900	1,200	25	75	1,200	50	600
B	600	600	1,200	50	50	1,200	50	600
C	900	300	1,200	75	25	1,200	50	600
All Enterprises	1,800	1,800	3,600	50	50	3,600	50	1,800

This imperfection would not hold under a perfect lease. In order that an equitable division of the product between resource owners and the true structure of costs within the firm be maintained, the lease would provide that the share of inputs conform more nearly to the share of the revenue for each enterprise rather than for the business as a whole.

Summary

In this paper an attempt has been made to analyze some common leasing customs. Because of the limited treatment certain omissions have been necessary. Yet it has been possible to point out the defects of many accepted leasing provisions. These imperfections are not, however, inherent in leasing systems, but arise because of the special customs which have developed and tend to be perpetuated over time.

Unfavorable comparisons between farm ownership and tenancy has often resulted because analysis has stopped with the isloation of imperfect leasing customs. Yet in theory perfect leasing systems are possible. The use of resources by the individual firm might thus be as efficient when the control is by lease as when the control is by ownership.

Similarly, the same degree of farming efficiency should be possible irrespective of the type of lease. In terms of theoretically perfect leasing systems it should make no difference whether the contract is of a cash, crop-share or livestock-share nature. All should result in an identical combination of resources were each "perfect." Differences in farm organization and efficiency stem not from different leasing systems per se but from the special customs which have grown up around individual leasing systems.

WARTIME DAIRY POLICIES

RICHARD J. FOOTE
Industrial Commodity Corporation

A REVIEW of wartime dairy policies from 1941 through July 1946 provides a particularly good example of the function of price as a regulator of production and consumption and of the complications which are introduced when prices are set by administrative action. This paper deals particularly with the way in which production adjustments in the dairy industry were achieved from 1941 through 1946 and with the methods adopted to obtain products needed to meet military and Lend-Lease requirements.

Background Material

Several aspects of the dairy industry need to be considered in appraising the wartime Government programs. The most important of these are:

a) The stability of total milk production.
b) The large proportion of the total milk supply used for fluid milk and for butter.
c) The concentration of production of certain manufactured products in a few states.
d) The substantial amounts of non-fat milk solids which normally are used for livestock feed or wasted.

From 1924 through 1940 total milk production increased steadily by an average of about 1 percent per year except for brief periods following major droughts. However, the largest increase from one year to the next was 3.7 percent and the largest decrease was 2.8 percent. The relative constancy of production grows out of the high fixed investment in mature cows, the low reproduction rate, and the large increase in rate of feeding required to bring about a small increase in milk production per cow.

During 1935–39 an average of 43 percent of the total milk production was consumed as fluid milk and cream and 33 percent of the total available fat solids were manufactured into butter. Thus these two groups of products accounted for 76 percent of the total available fat solids. Price relationships in the dairy industry normally are at such a level as to make fluid milk and cream the most profitable use for milk, with remaining products in the order:

1. ice cream,
2. dried whole milk,
3. evaporated milk,
4. cheese or the combined value of butter and non-fat dry milk solids,
5. butter as such with the skim milk used for casein, livestock feed or wasted.

Principal products for which increased production was needed during the war period were American cheese, evaporated milk, and non-fat dry milk solids. The percentage of the total U. S. production of these products during 1940 which was produced in Wisconsin was 52, 32, and 24, respectively, and in the East North Central States was 67, 56, and 38, respectively. Of the total non-fat milk solids produced in Wisconsin in 1940, 28 percent was used for these three products, with the bulk of the remainder going into fluid milk and ice cream, whereas for the United States as a whole only 10 percent was used for these items. Thus the problem of bringing about shifts in utilization of milk was complicated by a lack of plants in areas where milk could readily be shifted and a lack of milk in areas with ample plant capacity. The substantial seasonal variation in milk production intensified the problem.

During 1940, 46 percent of the total non-fat milk solids produced were used for livestock feed, industrial purposes, or wasted, while only 3 percent of the total fat solids were so used. The major item accounting for the high proportion of non-fat solids used for non-food purposes was the 40 billion pounds of skim milk and buttermilk remaining on farms from butter made on farms or farm-separated cream sold or consumed. The principal means of making these non-fat milk solids available for human use was by decreasing sales of farm-separated cream and increasing sales of whole milk sold at wholesale.

Production Adjustments in 1941

On March 15, 1941 the Department of Agriculture began to purchase substantial quantities of American cheese, evaporated milk, and non-fat dry milk solids for shipments to the British under the Lend-Lease Act. On April 29 a 6–8 percent increase in milk production was requested. At the same time it was suggested that a larger than normal proportion of the total milk supply be used for cheese and evaporated milk. On June 4 an increase of one-third in American cheese production and of one-fourth in evaporated milk

production was suggested. The requested 6–8 percent increase in total milk production was ample to permit such increases for these two items. Because of the tight shipping situation a shift in British requirements was made in the fall of 1941 from evaporated milk to non-fat dry milk solids. An increase of 40–50 percent in the production of non-fat dry milk solids was requested on November 22.

Government purchase prices for American cheese, evaporated milk and non-fat dry milk solids were increased rapidly from February through September 1941. Butter prices rose contra-seasonally from January through May but then leveled off until the spring of 1942. There was little economic reason for a rise in butter prices since most of the increase in demand was for other products, and milk production increased sufficiently so that increased production of the other products had little effect on butter production.

Total milk production increased from 109 billion pounds in 1940 to 115 billion pounds in 1941, or 5 percent. This was by far the largest percentage increase in a single year for the 17 years for which data were available. Cow numbers increased by 3 percent, reflecting mainly the relatively large number of heifer calves saved in previous years due to high prices for milk cows. Milk and butterfat prices were high relative to feed prices and farmers fed 13 percent more grain per cow than in the preceding year. As a result, milk production per cow increased 2 percent. American cheese production increased 25 percent; evaporated milk, 32 percent; and non-fat dry milk solids, 14 percent. Butter production increased 1 percent over 1940.

Production Adjustments in 1942

1942 goals announced by the Department early that year called for an increase above the previous year of 9 percent for butter, 17 percent for cheese, 25 percent for condensed and evaporated milk, and 50 percent for non-fat dry milk solids for human consumption.

To encourage production of non-fat dry milk solids the Department reduced its buying prices for American cheese and evaporated milk during February and March of 1942. This had the effect of raising the combined value of butter and non-fat dry milk solids relative to the other two products. On March 28 the Department announced that it would support the price of butter at 36 cents (92 score at Chicago), $1\frac{3}{4}$ cents above the previous support level.

This action had a similar effect. To further encourage production of *spray-process* non-fat dry milk solids, prices in mid-May were raised by ¾ cent per pound or about 6 percent.

In early June a substantial curtailment in production of evaporated milk was requested. Because of the shortage of shipping space, the Allied Nations had taken only 14 million cases of the 22 million cases originally requested by them for the year ended in March 1942, while the Department had purchased 37 million cases. Requirements for the fiscal year 1942–43 were estimated at 7 million cases. Moreover, the rate of production was over 40 percent above total domestic, military and foreign needs. At the same time it was stated that current production of American cheese and total non-fat dry milk solids was adequate to meet total needs but that some further increase in spray-process non-fat dry milk solids was needed.

On July 21, 1942, downward adjustments in Government buying prices were announced for evaporated milk and roller-process non-fat dry milk solids, while prices were raised for spray-process non-fat dry milk solids, butter, and American cheese. Under both the old and the new price schedules, with normal manufacturing margins, production of butter and either form of non-fat dry milk solids enabled manufacturers to return the highest prices to producers for milk not required for fluid consumption. The principal effect of the price changes on non-fat dry milk solids was expected to be a shift in domestic consumption from spray to roller-process powder. Spray powder was needed for lend-lease purposes because of its high degree of solubility.

Total milk production in 1942 increased to 119 billion pounds, 3 percent larger than in 1941. As in the previous year, most of the increase was due to a larger number of cows. Prices paid for milk and butterfat in relation to feed prices continued unusually favorable. Production of all major dairy products other than butter increased substantially. Increases above the previous year were 22 percent for American cheese, 8 percent for evaporated milk (despite a large reduction in the rate of production in the last half of the year), 70 percent for nonfat dry milk solids for human consumption, and 19 percent for ice cream. Butter production, however, declined by 6 percent.

Price Ceilings for Manufactured Dairy Products

During both 1941 and 1942 material shifts in the utilization of

milk were brought about by the comparatively simple method of varying relative prices. The establishment of price ceilings for manufactured dairy products on October 5, 1942, made it impossible to bring about further adjustments in production and civilian consumption of individual products by this method.[1] Space does not permit a detailed discussion of the price ceiling regulations as such. The complex restriction, limitation, set-aside, and subsidy programs required to meet military and lend-lease needs for particular dairy products, however, will be discussed in the following sections.

Allocation, Limitation and Set-Aside Orders on Manufactured Dairy Products

The first order designed to restrict civilian consumption of dairy products to meet military and lend-lease needs was issued on November 2, 1942. This required manufacturers of spray-process nonfat dry milk solids to set aside 90 percent of their production for Government purchase. The speed with which other similar orders were found necessary is indicated by the fact that by June 3, 1943, orders having a similar purpose had been issued for all major dairy products except fluid milk and evaporated milk. Before the end of the war, such orders were issued for virtually all dairy products. To simplify the presentation, these orders will be discussed by products rather than chronologically.

Butter—During the fall of 1942, butter production was several percent under a year earlier and, with prices held at ceiling levels and rising consumer incomes, butter began to move out of storage very rapidly. By mid-November storage stocks had reached a low level and supplies were considerably short of demand. To meet immediate lend-lease needs for butter, the Government on November 20, 1942, froze half of the supply of butter on hand in the principal storage markets of the country for purchase by specified agencies. This order made roughly 20 million pounds of butter available to meet immediate needs. Effective February 1, 1943, manufacturers were required to set aside 30 percent of their monthly production for sale to various Government agencies. The percentage required to be set-aside was varied from time to time,

[1] The establishment of price ceilings for fluid milk and cream and ice cream in March 1942 had little immediate effect on the dairy industry except to encourage a high rate of consumption. Prices already were sufficiently high to attract as much milk as needed into these uses.

with the highest figures prevailing during the spring and summer when production reaches its seasonal peak. The set-aside rate equalled 50 percent in June of some years and generally was set at zero during the six winter months. The set-aside order met Government requirements effectively, but civilian supplies were extremely short, particularly in the fall and winter months. Set-asides were discontinued after June 1946.

American cheese—Because of increased production, stocks of cheese in the winter of 1942–43 were much more adequate than for butter. However, beginning in February 1943 manufacturers were required to set aside 50 percent of their production for purchase by specified Government agencies. As with butter, this figure was varied seasonally, reaching a peak of 70 percent in May-July 1943 and dropping to 25 percent in November-December of 1943 and 1944. At least 80 percent of the cheese set aside was required to be of No. 1 quality or better. High quality cheese was required to withstand shipping conditions. No cheese was required to be set aside after July 1946.

Nonfat dry milk solids—As mentioned above, manufacturers were required to set aside 90% of their spray-process dry milk solids for Government purchase in early November 1942. This product was urgently needed for lend-lease and military use for reconstitution for drinking purposes, as production of dried whole milk, a more difficult product to manufacture, was relatively small. Some roller-process powder was released from Government stocks during the winter months to manufacturers furnishing spray-process powder to the Government. On June 1, 1943, this order was extended to roller-process powder but the percentage was reduced to 75%. By May 1944 production had increased sufficiently to reduce the set aside to 50%. The roller-process order was discontinued after August 1944 but the spray-process percentage was held at 40% until July 1946. The reduced percentages reflected increased production of non-fat dry milk solids and a shift in military demand to dried whole milk, production of which increased very rapidly during 1944.

Condensed and evaporated milk (case goods)—During 1943 production of evaporated milk in 14½-ounce cans for civilian use was limited to 90% of the 1942 peak and of condensed milk in 15-ounce cans to 100%. Similar limitations were continued throughout the war. These regulations were designed to save tin but also had the

effect of releasing milk for use in other dairy products. A voluntary set-aside program for evaporated milk was in effect during most of the war years. A relatively few major companies process evaporated milk and hence a voluntary program was feasible, but it was also favored by the existence of tin restrictions on evaporated milk for civilian use and by relatively high returns on Government sales compared with civilian sales—factors which were different from those encountered by the several thousand firms making butter and cheese.[2] During the winter of 1942–43 the Government released some stocks to the trade to alleviate the civilian shortage.

Ice cream—Consumption of ice cream on a volume basis is highly correlated with consumer income. With high consumer purchasing power, the ice cream which consumers would have liked to purchase at relatively low ceiling prices increased tremendously during the war. Milk solids used in ice cream after December 1942 were limited to a given percentage of production in an earlier period. Both the base period and the percentages were varied from time to time, but in 1943 milk solids used in ice cream for civilian consumption were limited to 65% of the amount used in the corresponding month of the period December 1941–November 1942. The fat content was reduced by more than the non-fat milk content but reduction in both were required by the order. Manufacturers were permitted to increase production during the summer months in certain years when it appeared that total milk production would be larger than available processing facilities for other dairy products. Due to the shift in production to frozen products containing a smaller percentage of milk solids, and to production for domestic military use, total ice cream production was reduced by less than 15% below the peak level reached in 1942. However, production for civilian use in 1943 was 25% less than in 1942. Provisions covering the use of non-fat milk solids in ice cream were discontinued in August 1944 and of fat solids, in September 1945.

Dried milk products—During 1943 production of dried milk products made partly from whole milk, including prepared ice cream mix, increased rapidly. As both equipment and milk solids were being diverted to the production of products not essential to the war effort, domestic sales of dried milk products made entirely or partly from whole milk were limited to 75% of the quantity sold

[2] A compulsory order was put in effect in June 1946 but no set-asides were required after that month.

in 1942 and of dried milk compounds, to 100%, effective in March 1944. This order was of especial value in obtaining more dried whole milk for the Army, which was needed particularly for reconstitution in the Pacific areas. Army and lend-lease purchases of dried whole milk increased from 35 million pounds in 1942 to 137 million pounds in 1945. Peak *production* in any year prior to 1941 was 29 million pounds.

Cheese other than cheddar—In prewar years the United States imported roughly 25% of the total cheese other than cheddar consumed here. Imports were reduced materially during the war, and price ceilings tended to favor the production of foreign types of cheese. Hence, production increased considerably, particularly during 1943. To maintain production of American or cheddar cheese, production of foreign types were restricted to the same amount as produced in 1942, effective in February 1944.

Rationing Programs

Only brief mention will be made of rationing programs here as they were ostensibly designed to secure an equitable distribution among various civilian groups rather than to obtain products for military or lend-lease use. Butter and cheese rationing was begun in March 1943 and continued until the fall of 1945. Because the cut in civilian butter consumption was so great and the amount of cheese per capita to be rationed was so small, neither program was particularly successful. A successful rationing program is assumed to be one that holds black market activities to a minimum, that permits all holders of coupons to purchase the product, which assures products to meet essential needs, and which requires a more or less equal sacrifice from all groups of users for which the product is not essential. Butter and cheese rationing failed to meet some of these tests, largely because of the inherent difficulties connected with the products as such and the fact that they were only part of an integrated rationing system that suffered a serious decline in quality of administration.

Rationing of evaporated and condensed milk became effective in June 1943. The program was designed to conserve limited supplies for infant feeding and special diets and for persons unable to obtain adequate supplies of fresh milk. Unlike most rationed products, supplies of canned milk were fully adequate to meet all civilian

requirements at the time the program was started. However, because of the seasonal nature of production, supplies would have been inadequate to meet even essential needs in the 4th quarter of 1943 had the high rate of consumption in the first two quarters been continued through the 3rd quarter. This program was for the most part successful.

Allocation orders for industrial casein and lactose also were in effect. Casein production was cut to about a third of normal during the war because of the diversion of skim milk to the production of non-fat dry milk solids. Imports from the Argentine were larger than normal but did not offset the decline in domestic production. In May 1943 essential users were limited to specified percentages of either rationalized requests or historic use, depending on the nature of the consuming industry. Demand for lactose increased materially during the war, particularly for the production of penicillin. Although production more than doubled, use was restricted from April to September 1944 to assure sufficient supplies for penicillin production. By the latter date production had increased sufficiently to meet all needs.

Limitation Orders on Fluid Milk and Cream

Although total milk production increased rapidly between 1940 and 1942, the rate of production, after allowing for normal seasonal variation, began to deline in the latter half of 1943. Consumption of fluid milk, on the other hand, was steadily increasing. Since roughly 46% of the total milk production in 1943 was utilized as fluid milk and cream, this resulted in a substantial squeeze on production of manufactured dairy products. It also caused intense competition for supplies among fluid milk dealers, particularly in highly populated areas during the fall low-production season. To assist in preventing a further rise in fluid milk consumption and to avoid direct consumer rationing which was considered impracticable, a system of dealer quotas in individual markets was established effective in September 1943. Quotas were established first in areas of heavy urban population where milk supply problems were most critical. Administrative expenses were met by assessments on the milk handlers for whom quotas were established, a unique basis for an order of this type so far as the author knows. In most areas, quotas for fluid milk were set at the June 1943 level, but quotas for

cream and milk by-products were reduced below that level when total milk supplies were short.[3]

It is doubtful whether orders of this type would have been successful had it been necessary to bring about much of a decline in fluid consumption. However, total milk production increased in 1944 and 1945, under the stimulus of subsidy payments, so that a slowing-down in the rate of increase in fluid consumption was sufficient to meet production requirements for manufactured dairy products. The major value of the orders probably was in evening out distribution in the so-called deficit milk markets during the late fall months.

Programs to Stimulate Total Milk Production

Because milk production cannot be changed by more than a few percent from one year to the next, a major part of the total wartime Government program for the dairy industry was concerned with bringing about shifts in the utilization of milk. However, increases in total milk production in the right areas made the obtaining of these shifts easier and hence was important.

Throughout the war farmers were urged to produce as much milk as possible, but they were not always given economic incentives to encourage them to do so. Dairy goals represented a compromise between the amount of milk needed to meet all requirements and the amount of milk farmers were expected to produce and, as such, were of little importance.[4] Mention already has been made of the increase in production brought about by high prices in 1941 and 1942.

Space does not permit a detailed discussion of general programs to stimulate production of feed, to allocate grains and high protein feeds between various users, to make machinery and equipment available to farmers, and to increase the supply of farm labor. Many of these programs were designed to be of especial benefit to dairymen. The orders allocating oilcake and meal and Selective Service regulations covering farm labor were of particular importance in maintaining milk production.

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[3] Sales of heavy or whipping cream were prohibited from Nov. 1942 until Sept. 1945 to conserve fat for the production of other dairy products. A similar order was reimposed during the summer and fall of 1946.

[4] Goals were of considerable value in determining the best use of available total resources. However, since as much milk as possible was desired, they were of little importance so far as milk production was concerned.

During the fall of 1943 dairymen were unable to obtain as much corn and other feed grains as they would have liked to purchase because of the combined effects of ceiling prices for corn and the high support level for hogs. Under these conditions corn producers in the Mid-West could secure materially more by feeding the corn directly on their farms than by feeding it to other types of livestock or selling it on the market. The shortage of feed for dairy cows was particularly severe in deficit areas on the East and West Coast. Pork production expanded by 41% between 1941 and 1943, while milk production in the 4th quarter of 1943 probably would have dropped to an annual rate of around 115 billion pounds without the subsidy program discussed below.

In October 1943 a general subsidy program for milk producers became effective. Payments varied by regions according to the amount of feed purchased and initially ranged from 30 to 50¢ per hundredweight for whole milk and from 4 to 6¢ per pound for farm-separated butterfat. Payments were made by county AAA committees upon application by milk producers. As price ceilings for dairy products contained no seasonal adjustment, subsidy rates were varied seasonally. During 1943 and 1944 the relative subsidy payment rates for whole milk and farm-separated butterfat encouraged farmers to increase sales of whole milk at wholesale. Returns on butterfat in farm-separated cream were later increased by legislation intended to reduce the apparent inequities confronting farm-separated cream producers and incidentally to protect butter production. A rise in the price ceiling for corn and a reduction in the support price for hogs during 1944 also encouraged increased milk production by making more feed available to commercial dairymen. Subsidy payments were continued until price ceilings were terminated on July 1, 1946.

The combined effects of these programs reversed the downtrend in milk production in the fall of 1943 and resulted in an increase in production to 122 billion pounds in 1945. The seasonal variation in subsidy payments tended to prevent a substantial shift to heavy spring and summer production which would have been encouraged by the constant price ceilings on dairy products. Perhaps most important, however, was the increased sales of whole milk at wholesale obtained by the higher payments for butterfat in whole milk than for butterfat in farm-separated cream. Of the total increase of 22.6 billion pounds milk equivalent in non-fat milk solids available

for human consumption between 1940 and 1945, 55% may be attributed to increased production of total milk and 45% to a shift from selling farm-separated cream to selling whole milk at wholesale and other means of reducing non-food uses. The latter was achieved at a fraction of the cost of the former in terms of either money value or physical resources.

Other Programs

Space permits only brief mention of other programs affecting the dairy industry. Subsidies were paid on American cheese and butter and to handlers of fluid milk in specified markets during certain periods. Substantial aid was given to dairy processors in obtaining new and replacement equipment for manufacturing and handling milk and dairy products. Every-other-day home delivery of fluid milk was required by the Office of Defense Transportation and may have a lasting effect on the dairy industry. All of these were important in themselves but they are not essential in outlining the types of developments discussed here.

Conclusions

On the whole, the wartime dairy program (particularly that part administered by the U.S.D.A.) was handled effectively and efficiently within the limitations imposed by the nature of the industry and the general administrative policy of maintaining relatively fixed price ceilings. Some of the programs could have been simplified had the general subsidy program been started a year earlier, as was repeatedly suggested by the U.S.D.A. Dairy Goal Committee. Part of the delay was caused by internal dissent within the Department as to the type of subsidy program which should be used. Also an earlier emphasis on the need for a shift from sales of farm-separated cream to sales of whole milk at wholesale by farmers would have been helpful, but to some extent such a program had to be delayed until new processing plants could be built in areas where a shift was feasible. The Department is to be commended for using in most instances the simplist type of program which could be expected to bring about the desired results. The tremendous sbifts in the utilization of milk and the expansion in production of certain items which took place would have been considered impossible to obtain by most dairy economists before the war.

THE 1945 CENSUS ENUMERATION OF LIVESTOCK ON FARMS

C. L. HARLAN
Washington, D. C.

THE Bureau of the Census made its third quinquennial Census of Agriculture in 1945 and began releasing records by States about the middle of 1946. But the final totals for the United States were not published until March 1947. A detailed appraisal of the 1945 Census as to its completeness and general comparability with previous censuses is not made a part of this paper. One conclusion, however, seems well supported. This is that these quinquennial censuses of Agriculture taken in 1925, 1935, and 1945 are more complete and more comparable than the decennial censuses taken as a part of the over-all censuses, which cover population, business, manufacturers, vital statistics and other subjects as well as agriculture.

The conditions under which the 1945 Census of Agriculture were taken were doubtless the most unfavorable that have confronted the Census Bureau in the present century. Because the country was at the peak of its war effort, there was considerable doubt as to whether a census enumeration should be undertaken, and the final decision was not made until late. This gave a very limited period for perfecting the plans, organizing a force of supervisors and enumerators, and building up a clerical and technical staff in Washington. The date chosen for the enumeration, January 1, tended to shorten the time for preparation and to enhance the difficulties that were being encountered. As a result, the enumeration was late in getting under way and because of manpower shortages and inefficiencies it made very slow progress. Except in a few States the enumeration extended over the first six months of 1945 and in some States it was not completed until late in the year.

In order to determine the average date of enumeration a sample of enumeration districts, by counties, was selected and tabulated, which gave an indicated average date by States and for the United States. This tabulation showed that for the earliest State the average date was about February 15, for the latest May 10, with the average date for the United States March 23. There were several unusual features in the taking of the 1945 Census that might be

mentioned. One of these was the type of schedule used. In all previous enumerations separate schedules were obtained for each farm and the editing was done by individual schedules. In recent years when tabulating machines have been used, all the data on each schedule were punched on individual cards. For the 1945 Census the information was collected by using books in which the questions were at the heads of columns and a separate line was given to each farm. Each book had lines for 25 farms (20 farms in Southern States). The editing was done in the books and the crop and livestock totals for the farms in each book were obtained by adding the items in each column. Except for sample farms and specified large farms, the crop and livestock information for each farm was not punched on cards. It had been expected that this book method would materially reduce the work of tabulation and make possible a much earlier completion of county and State totals. The delay in enumeration and other circumstances, however, did not make possible a fair comparison between this method and the one formerly used.

Another notable feature of the 1945 Census was the collection of a large variety and volume of information on a sample basis. This was a far departure from views formerly held by Census authorities that all items had to be included on all schedules. For this sample enumeration, the farms included in the "master sample," which had been drawn the previous year at the statistical laboratory at Ames operated jointly by the Department of Agriculture and Iowa State College, were used.[1] Separate books were prepared for the sample farms which included all the questions on the regular schedule followed by all the questions for which sample returns were to be collected. Among the more important items on the sample schedule were the detailed classifications of different species of livestock. It had originally been planned to tabulate the farms in the master sample first and on the basis of these results to make preliminary estimates of United States, regional and, in some instances, State totals of various items included in the schedule. But the delay in enumeration affected the sample farms as well as others and it was found impracticable to carry out this plan.

The delay in making the enumeration tended to affect adversely

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[1] For a detailed description of the master sample and the methods and techniques used in selecting it, see *Journal of American Statistical Association*, March 1945, Vol. 40, pp. 38–56.

the accuracy and comparability of much of the census data. It was particularly serious for inventory items and especially items that change materially as the seasons change. There is considerable evidence to indicate that the longer the interval between the time when the questions are asked and the period to which they relate the less exact will be the answers. For such items as acreage and production of crops, income and expense information or other economic data that relate to the previous year, answers obtained in early January may be but little different from answers obtained in late March. But in the case of livestock on farms as of a specific date, January 1, 1945 in this instance, a material difference can be expected between the information obtained if the enumeration is completed within a few weeks of the enumeration date and that obtained if the enumeration is spread over the six-month period following the enumeration date.[2] Available evidence indicates that, regardless of the date to which the enumeration is to apply, in most cases the answers given cover only livestock on the farm at the time of the enumerator's visit. Furthermore, the classification by ages reflects the ages at the time of enumeration. Hence a greatly delayed enumeration as of January 1, coming at a time when there is a heavy movement of livestock from farms and when the age classification of large numbers of different species is changing, cannot be expected to obtain the actual numbers as of January 1.

The Department of Agriculture makes estimates of the number of the different species of livestock on farms as of January 1 each year and undertakes to maintain a consistent and comparable series of such numbers over the years. Since, however, the Department has neither the authority nor facilities for making complete enumerations, it depends on the periodic enumerations of the Census Bureau for bench marks from which to project these estimates and for the basis for revising estimates already made. Because it was apparent that the livestock numbers obtained by the 1945 Census enumeration were not accurate figures for January 1, 1945, a thorough study and apprisal of the Census figures was necessary before they could be used as bench marks for estimating purposes. The balance of this paper is devoted largely to a description of this appraisal and the final results obtained by it.

[2] For a detailed discussion of the effects of changing dates of enumeration on the comparability of livestock censuses, see the processed bulletin—*Livestock on Farms, Revised Estimates 1867–1935*—issued by the Department of Agriculture in 1938.

The study and appraisal of the 1945 Census livestock enumeration was made by States. This work was done largely in the offices of the State statisticians of the Agricultural Estimates branch of the Bureau of Agricultural Economics (formerly Crop and Livestock Estimates). As the Census figures by counties and States became available, representatives of the Livestock and Poultry Division from Washington visited the various State offices and worked with the State statisticians. They reviewed the Census information by counties and districts, making comparisons with previous censuses and with indicated numbers from other sources. Numbers of the various species for January 1, 1945 were arrived at and were sent to Washington for further review. The final review was made by the Livestock Board in early February 1947 and the adopted estimates were published as a part of the Livestock on Farms Report issued by the Crop Reporting Board on February 18, 1947. The following table shows the results of this study and appraisal.

NUMBER ON FARMS, JANUARY 1

	1945			1940	
	Census[1]	Original estimate	Revised estimate	Census[2]	Estimate
	Number	Number	Number Thousands	Number	Number
Horses	8,499	8,841	8,715	10,087	10,444
Mules	3,130	3,405	3,235	3,845	4,034
All cattle	82,654	81,909	85,573	60,675	68,309
All cows	44,156	42,081	44,226	33,523	35,616
All hogs	46,735	59,759	59,331	34,037	61,165
Spring sows	8,482	9,212[3]	9,223[3]	7,988	9,413[3]
Spring sows	——	8,187[4]	8,298[4]	—	8,247[4]
All sheep	41,224	47,780	46,520	40,129	52,107
All ewes	30,632	37,244	36,062	35,580	42,638

[1] January 1.
[2] April 1.
[3] On farms January 1.
[4] Farrowed spring season.

It is obvious from the above table that the Census figures were not accepted as being the number of livestock on farms on January 1, 1945. In 1940 when the Census enumeration was as of April 1, the Census schedule was worded to eliminate young animals born within a given number of months before the date of enumeration—this number of months varying as among species. Hence the differences for 1940 between the Census figures and the estimates are

largely allowances made for disappearance of animals that were on farms January 1 but gone at the enumeration date. Evidence as to this disappearance was derived from sample farms reporting to the Department on the number of different kinds of livestock on January 1, 1940 and about April 1, 1940 and from records of marketings and slaughter and estimates of death losses during the first 3 or 4 months of the year. For 1945 no such sample data could be obtained since there was no way to determine in advance what the average date of enumeration might be in different States and the Census schedule asked for numbers of livestock on January 1. Thus the difference between the Census figures and the revised estimates for 1945 are judgment figures that represent the differences between what the Census reported and the number that would bave been enumerated as on farms and ranches on January 1 if the enumeration had been made within a relatively short period after that date. The basis of these judgment allowances for each species of livestock will be considered in some detail under the heading of the respective species.

Horses and Mules: There was less uncertainty as to what might have been enumerated in the case of horses and mules than with other species of livestock. This arises from the fact that the colt crop in 1945 was very small in relation to the number of animals on farms January 1, 1945—less than 3 percent for each class—and the total disappearance of horses and mules from farms in any year is only a relatively small proportion of the number on farms at the beginning of the year. Hence the number of 1945 colts that might have been included in the enumeration in the months after March could not have been large and had little effect on the number reported.

Records of marketing of horses and mules by States are much less complete than the records for other livestock. In most years the marketings represent largely a movement from farms in one State to farms in other States and do not greatly affect the change in the U. S. total. In 1945 there was a fairly large slaughter of horses but slaughter is a relatively small item in total disappearance. The principal item of disappearance of horses and mules is death losses, and these were relatively large in 1945.

The Census schedule asked for "All horses and colts, including ponies, January 1, 1945" and "All mules and colts, January 1, 1945." It seems probable that the number around January 1 was

reported by farms enumerated during January and February. But in March and subsequent months the general tendency was for the enumerator to ask for the number of horses and mules on the farm and for the farmer to report the number at that time. Assuming this to have been the case, the principal problem was to arrive at some allowance for disappearance between January 1 and the enumeration dates in the different States. In States where there are dependable and comparable records of horses and mules assessed, such records were used to measure the change in numbers between 1935 and 1940 and 1945. These measurements were compared with the Census changes between these periods and thus furnished an indication as to whether the 1945 enumeration was too small.

The sums of the revised State estimates gave totals for the United States for both horses and mules that were above the Census totals but below the original estimates for 1945. Compared with the original estimates the change in horses is mostly in the number of horses two years old and over with little change in either class of colts—1 to 2 years and under 1 year. Because of the delay in tabulating the classification items on the sample segment schedules, only partial and preliminary figures were available at the time the revisions were made. These partial figures tended to support the conclusion that the delay in the enumeration would seriously affect the dependability of the classification of all livestock. This was shown by the small number of colts under 1 year in relation to colts 1 to 2 years and the small proportion of all colts to horses over 2 years old. Apparently for most of the farms enumerated after the beginning of March, colts that were 1 to 2 years old on January 1 were included with horses 2 years old and over; colts that would have been under 1 year on January 1 were reported as colts 1 to 2; and many of the colts reported as under 1 year were 1945 colts born in the spring of that year.

Most of the adjustments in estimates of mule numbers were also in the number of animals over 2 years with little change in colts. The decrease from the original estimates was largely in the numbers in the Southern States, with the largest relative and actual decrease being in the total for the South Central States.

Cattle: The effect of the delay in the enumeration on the dependability of the Census figures was probably more difficult to appraise in the case of cattle than of any other species. There is a large disappearance of cattle and calves that were on farms January 1 in each

month during the first half of the year. But this disappearance is not uniformly distributed among different classes of cattle producers. It is relatively the largest in States and areas where large numbers of cattle are fed for market and is smallest in those States and areas where cattle are marketed largely in the fall months—which includes much of the large scale, range type of cattle raising. However, there are localized feeding areas of considerable importance in all of the principal beef type cattle-producing States and there is a continuous movement of cattle culled from dairy herds and of 'butcher' type cattle from small herds for local slaughter and to market. There is also considerable difference among cattle growers in what number they might be expected to report at different periods. It is probable that range type producers as well as large scale cattle growers in all areas who do not keep an exact current count on the number of cattle in their herds would report the number when the last count was made (which would in most cases be around January 1) less any sales that might have been made. It would probably be well into spring before another count would be made. On the other hand, most farm type cattle raisers and cattle feeders would have current records of the number of cattle on hand at any particular time and most likely this number would be the number reported when the enumeration was made considerably after January 1. There is much uncertainty as to when and to what extent 1945 calves would be reported. Over a long period of years, experience in getting reports from farmers on numbers of cattle shows a rather marked tendency to omit calves unless a detailed classification is asked. The 1945 Census schedule asked only for all cattle and calves January 1 and all cows and heifers 2 years old and over on January 1. Information as to the average date of enumeration was available only on a State basis. Therefore, it was not possible to appraise county and district figures by using available information as to the kind of production and the disappearance to be expected. This would be of material importance in States where large scale cattle raising, farm type production and cattle feeding are all of relatively large volume.

Before the Census enumeration was made, persons in the Department of Agriculture who were using estimates of cattle numbers and the records of cattle and calf slaughter which became available as a result of war-time slaughter control, generally believed that the estimates of cattle numbers were too low. These slaughter records

were showing a much larger non-inspected slaughter of cattle and calves than had previously been estimated from available information. It was becoming increasingly difficult to account for such large slaughter within the limit of changes shown by the estimates of January 1 inventories. It seemed fairly certain that either the level of the estimates of cattle numbers and the calf crops were too low or that the increases in cattle numbers were too large or the decreases too small.[3] Hence for several years there was a tendency in making the estimates of cattle on farms to take minimum increases—which were smaller than indicated by current sample data and smaller than indicated later by changes in the number of cattle assessed.

Various methods were used in arriving at indicated January equivalents of the 1945 Census cattle figures. One method was to estimate the disappearance of cattle, including calves born in 1944, between January 1 and the average date of enumeration, using market records and estimates of local and farm slaughter and death losses. From this total was subtracted the recorded inshipments of cattle during the same period and the difference was added to the reported Census number. Another method was to work out indicated numbers on hand each month by starting with the estimated number on January 1, 1945, adding to this an estimated number of calves born in January and recorded inshipments in January and subtracting from this sum the recorded marketings and estimated local slaughter and death losses during January. The resulting difference was the indicated number on February 1, 1945. In a similar manner the numbers on March 1, April 1, May 1, June 1, and July 1 were arrived at. Then the indicated number at the beginning of each month was multiplied by the percentage of farms enumerated in that month. The products were assumed to be the number of cattle that would have been enumerated in the different months. The sum of these products was the number that the Census presumably would have enumerated if the number on January 1 was about the number estimated and farmers had reported the number on hand about the first of the month in which they were visited by the enumerator. The relationship between this total and the estimated number on January 1 was then arrived at by dividing the

[3] This situation was covered in some detail by the writer in a communication to the *American Cattle Producer*—the official organ of the American National Livestock Association—and published in the May 1945 issue of that publication.

total by the January 1 estimate. The reported Census number was then divided by this percentage and the quotient was the indicated January 1 equivalent of the census number. This method assumes that all calves would be reported about as dropped and that all farmers would report the number of cattle as of about the enumeration date, including these calves. As previously stated, however, both of these assumptions are questionable. This method, however, was useful in States where 40 percent or more of the farms were enumerated after April 1.

Another indicated January 1, 1945 number was arrived at in States where there is a dependable series of assessment data by multiplying the January 1, 1935 Census number by the change shown between that year and 1945 in the number of cattle reported for assessment. The 1935 Census enumeration was as of January 1 and is considered as giving the most dependable January 1 number of livestock of any of the censuses. In the case of cattle, the census number in 1935 was taken as the estimated number on farms January 1 in most of the States. There were, however, several western States where subsequent developments indicated that the 1935 Census totals were too small and the estimates were later revised upwards. The procedure assumes that the number of cattle returned for assessment bears a fairly constant relationship to the number of cattle actually owned. There is considerable variation among States as to the percentage of cattle returned for assessment, due, in part, to the extent to which previous year's calves are required to be reported. But importance of cattle in the farm operation is also a factor—the more important the cattle enterprise the smaller the percentage of cattle that will commonly be reported. In making these assessment comparisons in States where the assessment date is in the spring (usually March or April), the number returned for assessment is converted to a January 1 base by adding to this number the recorded marketings and estimated local and farm slaughter in the months between January 1 and the date of assessment. This adjustment is quite important in some States where there is a large volume of cattle feeding, and the number of head marketed during the adjustment period may vary materially in different years.

In some States allowance was made for incomplete enumeration where there was convincing evidence that in some counties or areas a substantial number of farms or ranches had been missed

by the enumerators. Such evidence might come from comparisons: 1) of the number of cattle assessed with the number enumerated; 2) of the number of farms enumerated for specific crops for which exact information was available from other sources, or 3) of changes in total land in farms, total crop land or number of farms as shown by the Census and as shown by other sources.

With all of these indications as to the number of cattle on hand on January 1, 1945, a tentative figure was agreed upon by the Washington representative and the statistician in the particular State. If the indications were in close agreement, the selection of a tentative number was fairly easy. Where they were quite divergent, a considerable element of judgment was injected. If the indicated number was reasonably close to the current estimate, it was the general policy to retain that estimate.

If the classification figures from the sample segments and large farms had been available at the time of the State reviews or even by the time the final estimates were adopted by the Livestock Board, they might have thrown considerable light on what was actually reported to the enumerators. The percentage of cows 2 years old and over shown by the over-all Census figures seemed too large in relation to all cattle when compared with sample reports to the Department of Agriculture and by assessment data in many States. The presumption was that after March 1 many of the heifers that were 1 year old and over on January 1 were reported as 2 years old. It also seems that this percentage would tend to be high if cattle marketed between January and the enumeration date were not reported to the enumerators since a relatively large proportion of these are steers from feed lots. Before the final figures were adopted, tentative classification percentages were obtained from the Census for a number of States. Unfortunately, in compiling these figures, the classification for the large farms was included with that from the farms in the sample segments. As these large farms included many large scale cattle feeding farms and a disproportionate number of large scale farms growing beef cattle, the figures were not at all representative of the actual over-all classification since they were overweighted by steers from the feeding farms and by beef cows from the beef cattle raising farms. The final revisions show about the same number of all cows 2 years old and over as reported by the Census—44,226,000 for the former and 44,156,000 for the latter. But as a percentage of all

cattle the revised estimates of cows are only about 51.6 percent of all cattle, compared with 53.4 percent shown by the Census and 51.3 percent by the original estimates.

Hogs: The Census schedule included 2 questions on hogs—All Hogs and Pigs, January 1, 1945, and Sows and Gilts for Spring Farrowing, January 1, 1945. No classification of hogs was included on the schedule for the large and sample segment farms. Because of the heavy marketings and farm slaughter of hogs that always occur during the first three months of the year, it was expected that the delayed enumeration would result in a reported number of all hogs that would be much below the number that were on farms on January 1. On the other hand, the late enumeration would tend to give a total for sows and gilts for spring farrowings closely in line with the number of sows that actually farrowed in the spring season of 1945, and less than the number on January 1. Thus the Census figure on sows and gilts should be one of the most dependable livestock items enumerated by the Census. It would not be affected by the tendency to shift age classifications as was apparent in the case of the enumeration of all cows.

Since hogs are raised and marketed largely as a 'crop,' there is a much closer relationship between hog numbers on January 1 and hog marketings in the months subsequent to January 1 than with other livestock. For States which have a fairly complete record of marketings by months and from which most of the hogs produced move through market channels, it is possible to establish a very good relationship between numbers and marketings. These comparisons have indicated that there is a marked tendency for farmers to report hogs on hand at the time of enumeration rather than numbers on January 1 in years when the Census has been taken as of January 1. Even in 1935 the Census figures of all hogs were raised in some States to allow for under-reporting of January 1 numbers. But in none of the other January 1 Censuses was the enumeration drawn out over such a long period of time as was that of 1945.

As the 1945 Census totals by States became available it was found that the number of all hogs reported was running materially below the numbers estimated for January 1, 1945, as had been expected. The number of spring sows, however, for most States was not greatly different from the number estimated by the Department as having farrowed in the spring season of 1945. The Department's estimates show two figures for sows and gilts for

breeding or farrowing. The classification of hogs on January 1 is shown as pigs under 6 months, sows and gilts, and other hogs over 6 months. The number of sows and gilts is based upon the reports from farmers as to the number of sows bred or to be bred for spring farrowing. The June pig crop reports show the estimated number of sows and gilts that farrowed during the spring season. This number is always smaller than the estimated number of sows and gilts shown in the January classification. In any year farmers as a whole breed more sows and gilts to farrow in the spring season, which covers the period December 1 to June 1, than actually farrow in that period. This difference is accounted for by marketings of sows, death losses, failure to get with pig, and premature births. In years when hog production is expanding, the spread between sows and gilts on January 1 and sows farrowed in the spring season is below average, and when hog production is declining it is above average. By March the effects of most of the factors that cause the difference between January numbers of sows and gilts and the number of sows that farrow in the spring season will have taken place. Thus if farmers in 1945 tended to report the number of sows and gilts for spring farrow on their farms at the date of the visitation, and the average date was the latter part of March, the number reported should be fairly close to the number that farrowed in the spring of 1945. Thus it would be comparable with the estimate of sows farrowed in the spring of that year.

As with other species, there is much uncertainty as to just what farmers reported to the enumerators as the date of visitation became further and further away from January 1. From such evidence as is available in some States it seems probable that there was little tendency to report new crop—born in 1945—pigs in the first three months of the year. After that period, however, there is little to indicate what may have been reported. In some States, especially the Southern States, where a relatively large percentage of spring farrowings occur in December through February, a considerable number of 1945 pigs may have been included in the later enumerations. And what was reported when the enumeration was made after June 1 can only be guessed. There was some indication that in some States June sows may have been included in the number of spring sows reported.

In 7 of the North Central States (Wisconsin, Minnesota, Iowa, North Dakota, South Dakota, Nebraska, and Kansas), there is a

further check on the Census enumeration of sows. In these States, as a part of the State farm censuses made each year by the assessors, information is obtained on the number of sows to farrow in the spring. These enumerations vary from January and February in Iowa to April and May in other States. The enumerations are used as a check on the Department's estimates of spring sows, and the original estimates of sows farrowed in the spring of 1945 in these 7 States were based largely upon the number indicated by these enumerations. The following table shows these assessors' enumerations, the Census figures, and the original and revised estimates for for these States.

SPRING SOWS, 1945
(In thousands of head)

	Assessors Enumeration	Census	Original Estimate	Revised Estimate
Wisconsin	297	328	315	315
Minnesota	618	668	669	669
Iowa	1,798	1,840	1,861	1,842
North Dakota	121	148	139	139
South Dakota	303	347	337	347
Nebraska	416	466	481	473
Kansas	159	187	203	187
Total 7 States	3,712	3,984	4,005	3,972

The generally close agreement of the Census figures with those obtained by the assessors is fairly convincing evidence that the Census obtained the number of sows on hand at the time of the visitation and not the number on January 1 as the question asked for. If this were true in the case of sows, it was probably also true with all hogs but with considerable uncertainty as to whether and to what extent 1945 pigs were reported.

In many of the States where rather complete records of marketings by months are available, it was found that if the marketings between January 1 and the average date of enumeration, with an allowance for farm slaughter, local slaughter, and death losses during the same period, were added to the reported Census number of all hogs, the total was fairly close to the estimates of the Department of all hogs on January 1, 1945. Where this was the case the general policy was to retain the estimate or a figure reasonably close to it.

There was another indication that the Census figures of all hogs were low for January 1, 1945. All available evidence indicated that the number of spring sows in 1944 was substantially larger than the number in 1945. If the Census figures of spring sows in 1945 were substantially correct as to the number of sows that farrowed in the spring season of that year, then it is fairly certain that the number farrowed in the spring of 1944 was considerably larger. The 1944 spring pig crop was estimated as the third largest spring crop ever produced, being exceeded only by 1942 and 1943. The total pig crop of 1944—spring and fall— was estimated as the fourth largest on record, and not much different from that of 1939. With a pig crop of this size there is no evidence from marketing and slaughter records during the latter months of 1944 that would make it possible to reduce this number by January 1, 1945 to the low number reported by the Census.

Beginning in about 1943 and continuing to the present time there has been a growing spread between the indicated number of hogs for slaughter based upon the estimates of the pig crops and death losses and such records of slaughter as are available. This situation tended to support an expectation that the Department's estimates of pig crops and also of the number of hogs on farms January 1 were too high. If this were the case it was thought that the Census enumeration would indicate it. But because of the delayed enumeration, the Census figures of all hogs were not considered as a reliable check on the estimates of hogs on farms January 1, 1945. The Census figures on spring sows indicated that the estimates of the spring pig crops, at least so far as the number of sows to farrow is a factor, were about correct. There is no direct Census check on sows to farrow in the fall season but presumably the estimates of fall farrowings should be as dependable as those of spring since they are based upon the same kind of sample data with the relation of fall sows to spring comparable over a long period of years. If the estimates of sows and pig crops were reduced to bring them in line with available slaughter records, it meant that the number of spring sows in 1945 would be substantially below the number enumerated by the Census and as reported by the State farm censuses in the States making these.

Before a final decision was reached it was thought desirable that the problem should be discussed with the technical people in the Department who were in close touch with the statistical data covering

hog numbers, pig crops, and records of slaughter. The opinion of this group was unanimous that the best policy was to follow the Census and other records and sample data on sows and the pig crops indicated by these. This was the course finally taken. The only explanation of the discrepancy is that there was a large element of slaughter that was not covered in any of the records being obtained. These years were those of meat rationing and slaughter control and there was every reason to expect that there would be a large volume of hogs marketed or disposed of through other than regular channels.

Sheep: An appraisal of the 1945 Census enumeration of sheep involves not only an allowance for the effect of the delayed enumeration on the number actually reported but also an allowance for incompleteness in the enumeration itself. There has always been a rather marked difference between the estimates of the Department as to the number of sheep in the Western Sheep States and the numbers reported by the Census, even in years when the Census date was January 1. In some of these Western States it has been impossible to get anything approaching a complete enumeration of sheep numbers. This arises from the character of the industry in those States and the kind of ownership. The range sheep industry is operated in relatively large units and is still highly migratory. Unlike cattle or horses, many of these range outfits are not associated with specific ranch properties but operate largely either on leased land or on unimproved land. In many cases the owners or managers live in towns or cities which may be relatively far removed from the areas where the sheep are to be found. Unless these owners are located and the enumeration information obtained from them, the sheep involved are fairly certain to be missed by the enumerator.

Another feature of the sheep industry that is different from other livestock operations is that there are two fairly distinct types of operations .One of these is the handling of breeding flocks or stock sheep and the other is the feeding industry. To a considerable extent these operations are separate and are carried on by separate individuals. Also the feeding industry is to a considerable extent of a commercial type, being carried on in large feed lots that are not associated with or attached to any farming or ranching operations. It is also highly seasonal in character, being at its peak about January 1 and declining rapidly each month until the end of April.

The regular Census schedule carried two questions on sheep: "All sheep and lambs January 1, 1945" and "All ewes and ewe lambs kept for breeding ewes January 1, 1945." Detailed classification items were included on the sample schedule for large farms and for those in the master sample segments. As the Census figures for important sheep States became available it was increasingly evident that the number of ewes were under-reported. Ewes and ewe lambs make up from 90 to 95 percent of the total number of stock sheep but on January 1 much smaller percentages of all sheep in States where lamb and sheep feeding are important. In fairly important 'native' or farm flock States where there is little feeding activity, the percentages shown were noticeably lower than these. The disappearance of sheep between January 1 and the enumeration date would be largely of lambs and sheep on feed, except for normal death losses of stock sheep.

It so happened that the number of sheep and lambs on feed on January 1, 1945 was a record percentage of all sheep. It was nearly 15 percent of the total compared with an average of between 11 and 12. The first problem in reviewing the Census total sheep by States was to try to get some indication of the number of feeding sheep included. But if the reported number of ewes (including ewe lambs) was divided by the usual percentage of ewes in all stock sheep, and the quotient subtracted from the reported total of all sheep, the indicated number of feeders seemed much too high even for January 1. And it was reasonably certain that most of the feeders that had been marketed before the enumeration would not have been reported. In concentrated feeding counties where there was available a fairly complete record of the number on feed, it was apparent that only a part of the January 1 numbers was reported, but there was no information as to the average date of the enumeration in these counties. In view of all these indications, it was decided that the numbers of ewes, including ewe lambs, being reported to the Census did not include all of these. This conclusion was later verified by the tentative records of classification in some States. These showed that where the ewes 1 year old and over and the ewe lambs under one year were reported separately on the sample schedule, the sum of the two classes made up a normal percentage of all stock sheep—that is between 90 and 95 percent. But where these were reported combined on the regular schedule the percentage was considerably smaller. It seems fairly certain that

many reports did not include the ewe lambs with the ewes 1 year old and over on the regular schedule. It is not certain whether this deficiency was caused by the failure of the enumerators to ask the complete question or whether the wording of the question itself was confusing. Since the number of ewes was expected to be the most useful of the two items on sheep, especially in view of the delayed enumeration, this uncertainty as to what was actually reported tended to further reduce the value of the Census figures as a basis for the estimates of sheep numbers.

The difference between the Census total of all sheep and the revised estimates of the Department is about 5,300,000 head. A part of this difference is the allowance made for the delayed enumeration and the rest is allowance for under-enumeration in some of the Western Sheep States. The allowance for delay in enumeration was largely in States where feeding operations are important and where many of the lambs and sheep on feed would have been gone before the enumeration visit. The allowance for under-enumeration is largely in a few of the Western Sheep States. The revised numbers are down about 1,200,000 head from the original estimate, with most of this in the Western Sheep States. There was evidence that the estimates of sheep numbers were a little too high before any of the Census figures became available. This evidence from records of shorn wool appraised for purchase by Commodity Credit Corporation was usable only as to total numbers of stock sheep, and the 1945 Census was helpful in indicating in what States the estimated numbers were probably too large. These records, on the other hand, were additional evidence that the number of sheep enumerated by the Census was much too small. This situation is covered in some detail in the following section on wool.

Wool: For a considerable period of years there was uncertainty as to the volume of shorn wool production in the United States although there were several different bases for estimating it. In addition to the yearly estimates of the Department, based on estimates of the number of sheep shorn and average weight of fleece, there were the periodic reports of the Census of Agriculture as to the number of sheep shorn and the pounds of wool shorn and an indication of domestic shorn wool production each year from the reports of the Census of Manufactures on wool stocks and wool consumption. For the year 1939, the 1940 Census reported 289.8 million pounds of wool shorn on farms and ranches, the estimate of

the Department was 363.7 million, and the indicated production from the Census of Manufactures' reports was 413.6 million pounds. It was certain that the Census of Agriculture figure was too small, and there were indications that the Census of Manufactures figure was too large. The Department's estimate was between the two Census figures but there was no further way to check its accuracy. Hence, when the wool purchase program of Commodity Credit started, it was hoped that finally an exact figure for shorn wool for one or more years would become available.

For the year 1944 the preliminary estimate of the Department was 347.1 million pounds. The Census of Manufactures indicated 355.0 million pounds. The 1945 Census of Agriculture reports 279.9 million pounds. An exact figure from Commodity Credit records, however, is not available covering total 1944 shorn wool. The records of 1944 shorn wool appraised when converted to a greasy shorn basis show appraisals of about 325.0 million pounds. However, during that year manufacturers who were accustomed to buying wool directly from producers were permitted to do so. Also, wool produced in a number of minor sheep States did not have to be sold to Commodity Credit. There is only limited information as to what the quantity of this wool might have been, but what information there is indicates that it might have been over 10.0 million pounds. This added to the CCC appraisal gives a total of 1944 shorn wool of around 335.0 million pounds. Revised estimates of shorn wool production were made by the Department on the basis of the revised estimates of stock sheep on farms. The revised estimate for 1944 is 338.3 million pounds. If the Commodity Credit indicated total of 335 million is assumed to be approximately correct, the estimate of the Department is only about 1 percent above this. This discrepancy could be caused by too high estimates either of sheep shorn or of weight per fleece. The 1945 Census schedule did not ask for the number of sheep shorn, so there is no information from that source as to weight per fleece.

It is certain, however, that the Census is short in the number of farms reporting wool shorn. In important "native" sheep States where comparison is possible between the Census reports and the livestock sample data of the Department, there is rather close agreement as to the decline between 1940 and 1945 in the percentage of sheep farms to all livestock farms. The sample data shows that most of this decrease was in 1944. This would indicate

that there were considerably more farms with sheep in 1944 and on which wool was shorn in 1944 than there were that had sheep on January 1, 1945. Yet the Census report shows only about 88 percent as many farms reporting wool shorn in 1944 as had sheep in 1945. It is highly probable that Census enumerators failed to ask for wool production where no sheep were reported. If the Department's estimate of wool shorn in 1944 is substantially correct, it seems probable that the estimates of stock sheep on farms January 1, 1944, upon which number the wool estimates are based, are also substantially correct. This is additional evidence that the 1945 Census numbers of all sheep and all ewes are much too low, as there could not possibly have been a drop in numbers during 1944 equal to the difference between the Department's estimate for January 1 of that year and the Census figures for January 1, 1945.

Summary Conclusions: From the foregoing discussion of the various species and classes of livestock it is apparent that the 1945 Census enumeration of livestock on farms furnished an inadequate bench mark, either for revising the estimates for 1945 and preceding years or for projecting the estimates for succeeding years. But although the Census totals in themselves are very questionable as giving a dependable level of numbers of the different species as of January 1, 1945, they were of material value to the Department of Agriculture in furnishing evidence for making new estimates of numbers that are closer to the actual numbers than were the old estimates. Thus the estimates in the period from 1945 to 1950, when the next Census of Agriculture will be taken, are and will be more accurate than they would have been without the 1945 Census. What the actual numbers of livestock on January 1, 1945 were can never be known. It is believed, however, that the revised estimates of the Department are closer approximations of these than are the Census numbers.

It is unfortunate that there are two sets of figures, both from government sources, differing materially as to the number of livestock on farms January 1, 1945. For if the Census totals by States are too low, this error carries over to the county and minor civil division figures. Thus comparisons of change betweeen Census years for these smaller areas will be misleading. However, these comparisons will be no more misleading than ones made in the past where the Census enumerations were of different dates and the

numbers on January 1 are compared with those on April 1. A consistent and dependable series of livestock numbers from Census enumerations will never be forthcoming until these enumerations are taken as of the same date, cover the same classifications, and are completed in a minimum of time. The basis of such enumerations is a short schedule covering only essential items of acreage and inventories that all farmers can answer, with other more complex questions carried on sample schedules.

MIGRATORY FARM WORKERS IN THE UNITED STATES

LOUIS J. DUCOFF
Bureau of Agricultural Economics

PUBLIC concern regarding migratory farm workers has undergone three distinct and contrasting phases during the past decade. First, there was the prewar phase of concern over too many migratory workers in search of farm jobs. Their numbers were so large in relation to job opportunities that many of them were unwelcome and unwanted. The experience of migratory workers and their families during the 1930 decade reflected a most tragic chapter in our history which has been so well documented that it requires no recapitulation.[1] World War II brought about drastic changes in the labor supply situation which rapidly reversed the direction of public concern in the matter of migratory farm workers. The second phase was characterized by emergency measures to augment the numbers of seasonal farm workers, including the importation of workers from other countries, particularly to replace the depleted ranks of migratory workers.

A third phase was ushered in by the ending of the war, demobilization, and reconversion. Because the direction in which we are going cannot yet be too clearly seen, there is both hope and concern in the minds of students of the problems of migratory workers; for example, a Federal Inter-Agency Committee on Migrant Labor was created with representatives of Federal agencies directly interested in questions relating to living and labor conditions of migrant workers in industry, transportation and agriculture.[2] Because mi-

[1] Documentation of the prewar situation from many sources is contained in the hearings of the United States Senate Committee on Education and Labor (Senator LaFollette, Chairman) and those of the House of Representatives Select Committee to Investigate the Interstate Migration of Destitute Citizens (Representative Tolan, Chairman). The writings of Paul S. Taylor, Carey McWilliams, John Steinbeck and others were also important in creating public concern over the welfare of migratory farm workers.

[2] The need for a program of action on problems of migratory workers formed the subject of an Institute on Migratory Labor Problems held in Princeton, N. J., in June, 1945. In addressing this Institute, Professor Paul S. Taylor recommended the appointment of an interdepartmental committee of Federal Agencies along with other steps. Such a committee was established May 3, 1946 by the Retraining and Reemployment Administration of the United States Department of Labor, with Major General G. B. Erskine, Administrator, as Chairman. The Committee was dissolved on March 31, 1947 after completing a Report and Recommendations of the Federal Interagency Committee on Migrant Labor, published by the U. S. Department of Labor under the title, Migrant Labor, A Human Problem.

gratory agricultural workers will in the future as in the past comprise a very substantial part of all migratory workers, it is pertinent to examine their current and prospective situation from the vantage point of recent information on their numbers, distribution and employment conditions.

Why Migrant Farm Workers?—During short periods of cultivation or harvest, the sharp peaks of labor requirements in certain types of specialized agriculture produce a demand for much greater numbers of workers than are needed during the rest of the year. For United States agriculture as a whole, the greater part of the requirements for seasonal labor is met by the employment of local seasonal workers for pay and by the unpaid work of farm family members. Employment of migratory workers is primarily a feature of the pattern of production of that segment of the agriculture of our country which is characterized by relatively large-scale specialized production often referred to as industrialized farms. The labor of migratory workers makes possible the cultivation and harvesting of much of the acreage in fruits, vegetables, and in cotton, sugar beets, hops and other crops.

Several factors enter into the employment on such farms of migratory rather than local seasonal workers. The number of workers required for hand labor in cultivating or harvesting operations may be so large and the periods of employment so short that the recruitment of the necessary numbers of workers from the local labor supply is difficult or impossible. Moreover, the arduousness of the work together with the wage and living conditions that accompany it are often of such a nature that the locally resident population of working age would not accept it. In certain areas and certain types of production the larger employers of hired farm labor prefer migratory workers because the ethnic or socio-economic groups preponderant among migratory workers provide a more tractable labor supply than would local workers.

On the supply side, various factors operate to affect the numbers of workers who from want of better alternative employment opportunity leave their regular residences and with or without their families seek work as migratory farm laborers. The great depression of the 1930 decade, the droughts of the dust bowl area, and the displacement of farm workers by increased mechanization were the most important factors augmenting the supply of migrant farm workers in the decade before World War II. In contrast, the man-

power demands of a Nation at war, which afforded ample employment opportunities of a more continuous nature and which drew men into the armed services, greatly reduced the number of migrant workers available to farmers. The supply of migratory workers is a variable number depending on employment conditions in the economy as a whole and on technological and other conditions in agriculture which displace workers. Another underlying cause which affects the supply of migratory workers is the high rate of natural increase of population in many rural areas without a corresponding increase in employment opportunities.

How Many Migrant Farm Workers?—Accurate figures on the total numbers of migrant workers spending at least a part of the year in farm work have not been available in past years. Considerable information was obtained during 1945, however, which portrays the situation existing after nearly four years of war. At a peak week in the fall harvest, a national survey indicated a total of about 500,000 migrant workers employed on farms of the United States. This total included about 400,000 citizens of the United States and nearly all of the 85,000 foreign workers who were imported temporarily under international agreements and transported where needed by the Department of Agriculture. In addition, some part of the 95,000 prisoners of war working on farms in the United States in September 1945 were moved from one locality to another during the year, although it was the policy of the War Department to locate groups of prisoners where work would be available for as much of the year as possible in one locality. Most of the imported foreign workers and some of the prisoners of war were in effect wartime substitutes or replacements for prewar domestic migratory farm workers who no longer sought such work when steady jobs became available.

Figures on employment of hired farm workers in one week of the year—even a peak week for hired employment in agriculture as is the case in the latter part of September—understate the total number of different persons who do such work in the course of a year. Various studies of the Bureau of Agricultural Economics provide the basis for the estimates shown in Table 1 of the total number of different individuals who were migratory farm workers during some part of the year 1945. The estimates relate only to migratory farm wage workers and exclude all non-working dependents.

It is important to note that of the persons who were migratory

TABLE 1. ESTIMATES OF MIGRATORY WORKERS EMPLOYED ON FARMS IN SELECTED WEEKS OF SEPTEMBER 1945 AND JULY 1946, AND AT ANY TIME OF THE YEAR DURING 1945, UNITED STATES AND MAJOR REGIONS

Area	September 16–22, 1945	At any time of the year during 1945	July 21–27, 1946
	Thousands	Thousands	Thousands
United States	510	600	400
Domestic	425	480	340
Imported foreign	85	120	60
North	180	240	220
Domestic	150	200	200
Imported foreign	30	40	20
South	170	180	50[1]
Domestic	160	165	40
Imported foreign	10	15	10
West	160	180	130
Domestic	110	120	100
Imported foreign	50	50	30

Source: Based on data from enumerative surveys of the Bureau of Agricultural Economics. In these surveys, migratory farm workers are defined as workers from outside the county who are lodged in places not considered their regular homes. The estimates relate only to migratory farm wage workers and exclude all dependents except those who also did farm wage work during the specified week or year.

[1] The decrease of 120,000 migratory workers in the South between the fall of 1945 and the summer of 1946 is seasonal; almost all of the 170,000 migratory workers in September were engaged in picking cotton.

farm workers for some time during 1945, the number in the West was no larger than in the South and was exceeded by the number in the North. Dramatization of the Joads, the "Oakies," the "Arkies," the Mexicans and the Filipino migratory farm laborers in California has tended to make the majority of the citizens of other States aware of a migrant farm labor problem only in California. Actually, most of the States which are important in agricultural production have migratory laborers used on their farms in certain areas during the course of a year.

Migratory farm workers, including domestic and imported foreign workers but not prisoners of war, made up only about one seventh of the hired farm working force of the United States in 1945, which is estimated to have included more than 4 million different persons. Their importance in agriculture lies more in their availability in large numbers to growers at the times when the demand for short-time seasonal labor is not met by the local supply.

This highly mobile portion of the hired farm working force thus permits many agricultural employers to increase greatly their number of workers in certain parts of the season without having to provide regular employment. The availability of a mobile supply of labor also permits the needs of a number of employers to be met by the same workers, a condition which contributed to a fuller utilization of available labor during 1945 and earlier years of the war period.

Present Trends in Migrant Farm Workers.—The two dates for which estimates of the numbers of migratory farm workers are given for 1945 and 1946 in table 1 are in different seasons of the year and consequently cannot measure the trend from one year to the next. For example, the decrease in the South of 120,000 workers from the fall of 1945 to the summer of 1946 is seasonal, reflecting largely the fact that the cotton picking season had not begun when the 1946 survey was made. In the other direction, the rise of 40,000 in the North is consistent with the generally higher summer than fall level of hired farm employment in that region. The fact that the total level of hired farm employment in 1946 was slightly above that in 1945 suggests an increase in domestic migratory workers that at least offset the cessation of use of prisoners of war by mid-1946 and a reduction of about one-third in the number of imported foreign workers being used on farms.

Some increase in domestic migratory farm workers was probably occasioned by the return of veterans and war industry workers to peacetime jobs that resulted in displacement of other workers, especially those who are normally less sought by employers—youths, women, and racial groups subject to discriminatory hiring practices. Another factor operating to increase the number of workers available for farm work—sometimes on a day-haul basis, sometimes as migratory workers—has been the reduction in take-home pay of major breadwinner because of elimination of overtime or downgrading. This makes for an increase in the number of secondary workers who must also seek employment to supplement the family income.

Long-term Outlook for Number of Migrant Workers.—The longer-term outlook for the number of migratory farm workers in the United States is more predictable from the point of view of demand than supply factors. An increase in the use of newly devised machinery in more of the cultivating and harvest operations which

have traditionally required a large amount of hand labor is inevitable. One effect of the manpower situation during wartime was to increase the desire on the part of many growers to substitute machines for hand labor, especially when there was no certainty that the hand labor would appear in sufficient volume at the time of the year needed. The inventive genius of the United States has by no means exhausted the possibilities of new types of machines which can handle additional agricultural operations. The cotton picker alone may obviate the need for a large proportion of migratory workers in the Cotton Belt. It seems safe to conclude that continued technological advances could reduce greatly the number of migratory workers actually needed on farms during the next decade if the general economic situation remains favorable to continued mechanization of agriculture.

If the record of the past holds a clue to the future, however, factors affecting the available supply of migratory workers will be more important in determining the numbers actually seeking seasonal farm jobs than will the demand situation. During the 1930 decade, it was the decrease in alternative employment opportunities which led to the large increase of migrant workers rather than any marked rise in seasonal agricultural labor requirements. The surplus labor supply situation resulted in considerable periods of unemployment for many migrant workers, very intermittent employment for the more fortunate, and depressed wage rates. As in the past, the future number of migrant workers will probably become excessive unless the general economic situation of the country stays good and large groups of workers are not forced onto the road in search of manual employment.

Extensive disemployment from urban jobs, or through technological displacement such as could arise from mechanization of cotton production would increase the number of migrant workers. In the depth of the great depression, some estimates have placed the number of migratory workers seeking farm jobs at over twice the current number. Should another depression occur, it would doubtless lead to a large increase in migrant workers, although unemployment compensation benefits and veterans' allowances might make the increase less marked than in the 1930's.

Who Are the Migrant Farm Workers?—The composition of migrant farm workers in the United States has changed very greatly the course of the years. The army of migrant workers who used to

follow the grain harvests from Texas to Canada were mostly men, traveling without families. Since their displacement by combines in the 1920's, single men have formed smaller proportions of the migrant farm working force and family groups have become more important.

Minority race and nationality groups have always bulked large among migrant farm workers. Mexicans and United States citizens of Mexican descent have long formed some of the most important migratory streams. In earlier decades, recently arrived European immigrants with their families often turned to migratory farm labor jobs and even at present, families of recent European origin living in Northern cities often go to the fields for the summer harvests. Along the West Coast, orientals have been important in the farm labor picture, with Filipinos acquiring special skills and speed in specialized harvest operations. In more recent years, a large migratory stream of Southern Negroes has followed the harvests up the Atlantic seaboard and into special crop areas of the Middle Atlantic States.

But native United States white workers have also joined many of the migrant streams. Especially in the 1930 decade, hundreds of thousands of workers displaced from the Dust Bowl and the western part of the Cotton Belt trekked to California and competed with minority groups for the available farm jobs. In the midwest and along the Atlantic seaboard as well, native-white citizens of long settled ancestry have swelled the migrant labor streams. From the self-sufficing farming areas of the Southern Appalachians, small-scale farm operators and members of their families frequently migrate north for summer field work, and return to their small farms in winter.

There is a great diversity of the groups found among migrant farm workers in different special crop areas widely scattered over the country. More often than not, however, they represent disadvantaged groups—those who because of race, nationality, lack of education or occupational skills have not readily found employment of a regular nature. Among those traveling in family groups, wives and young children frequently work to augment the family earnings when work is available for them.

In July 1946, some information was obtained on the characteristics of migratory farm workers employed during the survey week. In every region the proportion of females was higher among migrant

than nonmigrant farm wage workers. Among migrant farm workers the percentage of women and girls was 20 percent in the North, 26 percent in the West, and 41 percent in the South. Corresponding percentages for nonmigrant workers were 6 percent in the North, 5 percent in the West, and 33 percent in the South. For the country as a whole, World War II veterans made up a slightly higher percentage of male migratory workers than the 13 percent of veterans among local workers.

How Much Work Do Migrant Workers Get?—One of the greatest problems faced by migrant farm workers along with other seasonal farm workers is the intermittency of the work available to them. This chronic problem was somewhat alleviated during wartime and the current period by the much greater availability of nonfarm jobs with which farm employment could be supplemented. Even under the best conditions, however, migrant workers lose available working time in the very process of going from one place to another. In addition, time may be lost in contacting employers and arranging for work, after a place is reached. There is always the problem of getting to the right place at the right time. Because of bad weather, a delayed season, or incorrect information, the arrival of migrants may be too early and they must undergo a period of unemployment before work actually begins. After work has begun, bad weather may cause interruption of the harvest, while poor yields or the presence of excessive numbers of workers may shorten the duration of the work.

Wartime saw many improvements in the direction of fuller utilization of available farm labor. The necessity of guaranteeing employment for a specified proportion of the time available in the case of foreign workers transported by the Department of Agriculture led growers to plan for their labor needs in advance. Cooperation among growers in working out as much continuity in employment as possible for groups of workers to be brought into a county frequently aided in obtaining the amount of labor required without piling up the surpluses which often characterized the prewar situation. The Extension Service in its farm placement program also contributed to a fuller utilization of domestic farm workers, through routing and referring workers to farmer employers. Despite these wartime advances many migratory farm workers still experience periods of unemployment in the course of a year which could be reduced through improvements in the operation of placement programs.

Wages of Migratory Farm Workers.—The wage structure in agriculture is complex, with many types of time and piece rates paid for different types of work in different parts of the country. Generally the types of work performed at harvest time or at other seasons when the demand for labor is high are paid at rates which yield higher hourly and daily earnings than those from general farm work. Because migratory workers usually supplement the local labor supply at the time the demand is greatest, they average higher earnings on a short-time basis than do regular farm workers.

In September 1945, migratory workers employed in crews in the South averaged 39 cents an hour, compared with 30 cents for local crew workers. The differential was not great because most of the crew workers, migratory and local, were engaged in cotton picking at rates which were pretty uniform. Lower earnings of the local crew workers were probably due mainly to a greater proportion of children and youth among them than among migratory crews. In the Northern States, migratory crew workers had higher average wages than that of local crew workers. But in this region, the migratory workers were concentrated in relatively few special crop areas and were engaged in the better paid harvest operations while local crew workers who were widely distributed over the Northeastern and North Central States were engaged in a variety of types of less well paid farm work. In the West, also, migratory crews averaged higher wages than local crews, 90 cents per hour compared with 77 cents.

Special surveys of wages of harvest labor in selected crops and areas during 1945 provide a basis for closer examination of wage differentials between local and migrant workers engaged in the same harvest operations. Differences in hourly cash earnings by local and migratory crews were small, with migratory workers usually making a few cents more per hour, though in some cases the local workers averaged more than the migratory. All the evidence suggests that while migratory workers are not discriminated against in the matter of rates paid for farm work, neither are they generally paid higher rates for the same type of work. However, they frequently work at the better paid types of seasonal farm work and when paid piece rates often exceed local workers in performance and daily earnings.

In July 1946, wage differentials as between migratory and local workers were not consistent in the several major regions of the United States. A great diversity of harvest work was in progress at

that time of the year, and average earnings differ widely among the harvesters of different crops in the same region. Over 97 percent of all migratory workers surveyed were doing harvest work, with 41 percent engaged in the harvesting of fruits and vegetables. Hourly earnings of the migratory workers included in the survey were slightly higher than those of local workers in the North and slightly lower in the South and West.

The wage problems of migratory farm workers do not stem from any discrimination against migratory workers. They are rather the result of two factors: (1) the generally low levels of farm wages relative to those of industrial workers; and (2) the irregularity and intermittency of employment, which means that even though current average hourly earnings for some groups of migratory workers may be satisfactory, the probability that earnings are satisfactory over longer time periods decreases rapidly as the unit of time is lengthened to a month, a season or a year.

One of the greatest gaps in information about migrant farm workers is with respect to their annual earnings from farm and nonfarm work on an individual or family basis. Various studies of the situation in the 1930 decade uniformly showed average annual earnings too low to maintain a family at a minimum adequate level of living. Low rates of pay were important in producing the situation and the average amount of employment obtained during the year was probably equally or more important. Little information is available on recent changes in average earnings from work obtained by migrant workers during a year, and on their average annual earnings from supplementary nonfarm work. For those hired farm workers, migratory and nonmigratory, who worked 250 or more days at hired farm work in 1945, the average cash farm wages earned during the year were $914 but among those working only 6 to 10 months the average wages from farm work were only $524. To what extent this latter group supplemented their earnings with wages from nonfarm work is not known, nor do we know how closely annual earnings of migratory workers approximate those for all farm workers. Except for some form of housing provided to some migratory workers without charge, little is furnished these workers in the way of perquisites, such as meals, farm products, etc.

Special Problems of Migrant Farm Workers.—Migrant farm workers share many of their problems with local seasonal farm workers

—intermittent employment, low wage levels which prevail for most types of farm work, often inadequate housing, and a low social status accorded them and their families by other residents of communities in which they work. But in all of the matters except level of wage rates, the problems are usually more accentuated for migrant farm workers than for local. Especially in the matters of housing, medical care, education for their children, and general social status in the community is the average lot of migrant farm workers below that of local workers.[3] The very fact of migrants being detached from any home community renders more essential their being provided with safequards in the way of medical care, sanitary standards of housing, insurance against accidents, educational and day-care facilities for their children, etc. It is in these matters that growers individually or collectively, sometimes in cooperation with local community groups, can do much to provide improved working and living conditions for migrant farm laborers and their families.

During the period of wartime scarcity of labor, many growers learned the value of maintaining good relations with their workers and good working and living conditions for them. The voluntary efforts of these more advanced employers would be aided through legislative support of wider adoption of practices which better the lot of migrant farm laborers. Similarly, some community groups have set excellent examples in providing sanitary reception centers for migrants and in establishing day-care centers for the younger children of migrant workers. More wide-spread activities of this sort would benefit employees, workers and the communities. Government housing centers operated both for imported workers and for domestic workers provided examples throughout the country of workable sanitary and health standards in housing for migratory farm workers.

Résumé.—The presence of large numbers of migrant farm workers has been a feature of American agriculture for decades and will doubtless continue to be so in the future. The number of such workers tends to diminish in times of prosperity and to increase in times of depression, but even in the recent prosperous years with a

[3] See *Migrant Labor A Human Problem*, Report and Recommendations, Federal Interagency Committee on Migrant Labor, U. S. Department of Labor, March 1947.

tight manpower situation, there were 600,000 migratory workers, including the imported foreign workers who substituted for domestic farm workers.

Migrant farm workers have included a wide variety of racial and nationality groups, and a disproportionate share of disadvantaged social and economic classes. Their lot is partly shared by other seasonal farm workers in such respects as insufficient employment security, low annual earnings and deprivation of the protection from social legislation regarding wage and hour standards, unemployment compensation, workmen's compensation and old-age insurance. But migrant farm workers experience special disadvantages in time lost from work in migrating and securing employment, in the low standards of housing and sanitary facilities available to them, and in the lack of educational and other community services for themselves and their children. They usually do not meet residence requirements for public assistance or work relief in times of unemployment. Their working and living conditions often result in higher incidence of the types of diseases associated with insanitary conditions.

Because migrant workers are generally unorganized, they are seldom articulate as a group in demanding improved working and living conditions. Public and private agencies in cooperation with grower-employers and local community groups should share in concerted and continuing efforts to improve the living and working conditions of this group which is so crucially important in meeting the peak labor needs of commercial agriculture in many localities.

FARM HABILITATION PERSPECTIVES IN THE POSTWAR PERIOD

SAMUEL LISS*
Farmers Home Administration

THE Farmers Home Administration Act of August 1946 may be considered a milestone in the field of Federal agricultural supervised credit. As formerly under the Farm Security Administration, this credit is to be associated with direct farm and home management guidance of disadvantaged, low-income family farmers who are unable to obtain financial accommodations from conventional lending institutions.

The Congressional mandate received by the Farmers Home Administration, the newly created agency, is considerably clearer in intent and more specific in defining the objectives to be achieved than those contained in previous executive orders, appropriation acts, or in the Bankhead-Jones Farm Tenant Act of 1937. The new statute largely amends the latter act. On the whole, however, the new agency is more limited in the choice of farm habilitation techniques than were the Resettlement and the Farm Security Administration, its predecessors.[1]

* The views expressed in this article are not necessarily those of the Farmers Home Administration.

[1] The Farmers Home Administration Act of 1946 abolished the Farm Security Administration, which had operated as an agency under the provisions of the Bankhead-Jones Farm Tenant Act and under the authority of appropriation acts and executive orders, and established in its place, as a statutory agency, the Farmers Home Administration.

To this agency were transferred practically all the functions of its predecessor either for operation or liquidation. In addition, the new act expanded, broadened, and clarified the farm tenant and rural rehabilitation titles of the Bankhead-Jones Act. The major significant differences in the provisions between the Farmers Home Administration Act and previous legislation are as follows:

Title I (*Tenant Purchase Loans and Mortgage Insurance*): a) The new act provides for the extension of real estate loans not only for the *purchase* of farms, as heretofore obtained under the Bankhead-Jones Act, but also for *enlarging* or *improving* family farms for more efficient operations; b) In the past, loans under this title were used primarily to finance tenants and other non-owners in the purchase and improvement of their farms at time of acquisition. The new legislation permits *owners*, as well as non-owners of undersized or underimproved farms to acquire, enlarge or improve farms; c) The principal addition of authority to the new agency is the establishment of a farm-mortage-insurance system for the protection of orthodox lenders of funds on farm-ownership loans similar to the long-term mortgage loans made directly by the agency itself.

Title II (*Production and Subsistence Loans*): While the Bankhead-Jones Act gave specific legislative authorization for the continuance of the rural rehabilitation loans, which prior to 1937 had been made under executive orders and financed by funds from appropriations for relief and work relief projects, it provided for only

There is little doubt that many credit-handicapped low-income farm families will be in need of habilitation in the years ahead. Despite war time and more recent high records of farm production, farm prices and farm income, not all farmers have shared alike in the benefits. A large number of farm families have not shared in this prosperity because they farmed with poor and insufficient land, inadequate capital and working equipment, and with inefficient management practices.

It is to this agricultural sector that the Farmers Home Administration, one of the action agencies charged with the task of postwar habilitation of low-income farm families, will logically address its responsibilities. If it is to have correct perspectives for discharging its responsibilities with the maximum effectiveness, awareness of the impact on agriculture of the changing manpower requirements and of production efficiency in the industry is indispensable.

This paper a) describes the manpower and productivity setting in which postwar farm habilitation programs will be operating, b) evaluates the perspectives for such programs, and c) projects the over-all area of responsibility and the potential habilitation caseload of the Farmers Home Administration.

Part One—The Manpower and Productivity Setting

A. Manpower and Productivity Trends in Agriculture

Although agriculture has increased in both output and production capacity, it has been shrinking relative to our total economy with respect to occupational and employment opportunities. In the past 125 years the proportion of the Nation's labor force engaged in

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an initial appropriation for this purpose. Thus, until the passage of the present act, the rural rehabilitation loan program of the F.S.A. had been financed by annual appropriations without the benefit of organic legislation. The new act rectifies this situation by authorizing the appropriation of "such sums as the Congress may from time to time determine to be necessary to enable the Secretary to carry out the purposes of this title."

Early Habilitation Techniques Eliminated: a) Present act re-affirms previous legislation for (1) the liquidation of rural rehabilitation and resettlement projects, and (2) for the prohibition of loans to any corporation or cooperative association, for leasing of land designed to carry on operations in collective or cooperative farming for the organization, promotion or management of homestead associations; to land-leasing or purchasing associations, or for cooperative land purchasing for settlement or resettlement purposes; b) Authorizes the liquidation of farm-labor supply centers, farm-labor homes and camps when they are no longer needed, or 6 months after official termination of hostilities, whichever is the earlier.

Misc.: The F.S.A. followed the practice of extending credit only to those who were unable to obtain it from conventional lenders, and to "graduate" such borrowers to conventional lenders as soon as their loans qualified. These two practices are now statutory requirements.

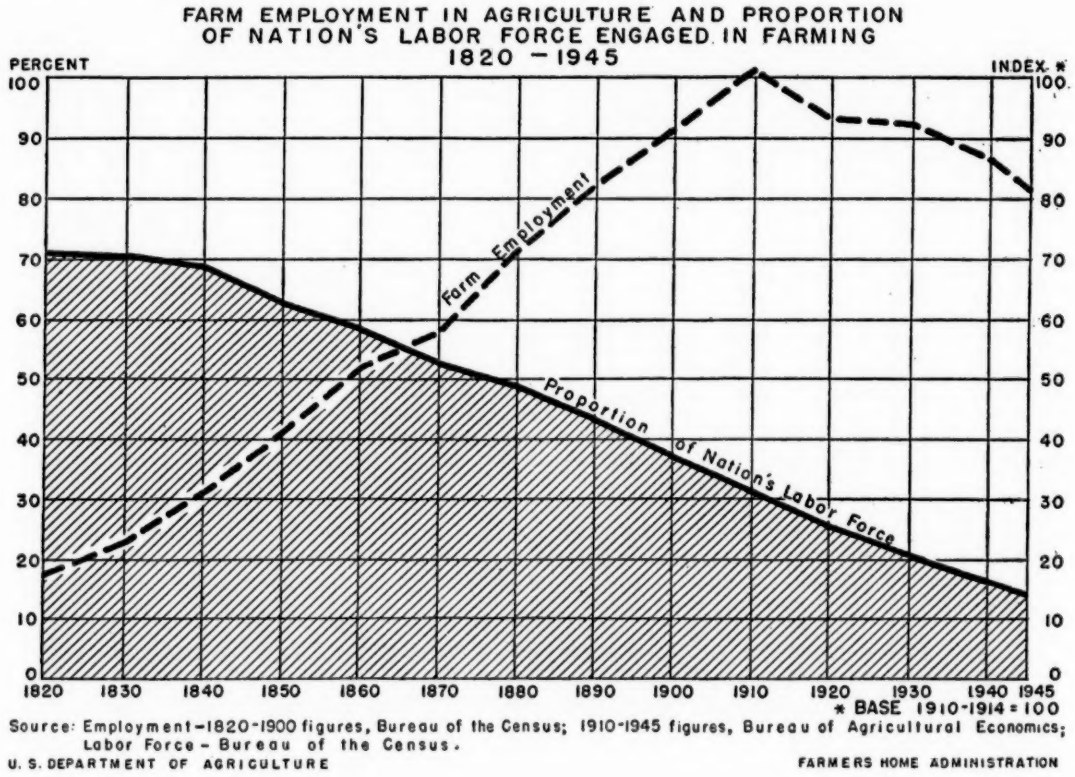
FARM EMPLOYMENT IN AGRICULTURE AND PROPORTION
OF NATION'S LABOR FORCE ENGAGED IN FARMING
1820 – 1945
PERCENT
INDEX *
100
90
80
70
60
50
40
30
20
10
0
Farm Employment
Proportion of Nation's Labor Force
1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1945
* BASE 1910-1914 = 100
Source: Employment – 1820-1900 figures, Bureau of the Census; 1910-1945 figures, Bureau of Agricultural Economics;
Labor Force – Bureau of the Census.
U. S. DEPARTMENT OF AGRICULTURE
FARMERS HOME ADMINISTRATION

FIGURE 1

farming has declined, even as farm production has risen. In 1945, less than 2 out of every 10 workers in the United States were engaged in agricultural pursuits, as contrasted with about 7 out of every 10 in 1820. (Figure 1.)

Until 1910, agriculture furnished employment to a smaller and smaller proportion of the Nation's workers, but the actual number employed in farming continued to rise. Since 1910, the number of workers engaged in agriculture has declined both absolutely and relatively. Between 1910 and 1945, average annual employment in agriculture fell almost continuously, from about 12 million (1910-1914 average) to about 9.8 million, or a drop of almost 20 percent. For every 100 workers employed in farming 1910–1914, about 90 were in demand in 1935–1939, and about 80 in 1945.[2]

World War II accelerated an increase in farm labor productivity and simultaneously speeded up the contraction in occupational and employment opportunities in the farm industry. In 1944 (despite war-time shortages of labor, equipment and materials) national agricultural production for sale and for consumption in the farm home was about one-third greater than in 1935–1939. This greater volume was produced with 8 percent fewer workers than before the war. Even in terms of gross farm production[3] the increase between 1939 and 1944 was 18 percent, but the total man-hours expended for the 1944 output were only 3.6 percent above those used in 1939 —or only one-fifth of the increase in gross farm production. This was reflected in the increase in output per worker of 26 percent in 1944 over 1939.[4]

The decline in the importance of agriculture as an employer of manpower since 1910 is attributable to the interaction of basic demand and supply forces affecting agricultural commodities. On the

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[2] In part, this decline is a reflection of war-time shortages of agricultural manpower. But it is also true that these shortages were related to the increased demand for labor resulting from greater war needed production. Compared with 1910–1914, average annual employment declined 15 percent during the 1940–1945 period, and about 10 percent between 1935 and 1939.

[3] Gross farm production measures calendar-year production of all crops and pasture consumed by all livestock, and the product added in the conversion of feed and pasture into livestock and livestock products for human use and into farm-produced horse and mule power. It also includes production of all other farm products for human use. The principal difference between gross farm production and agricultural production for sale and for consumption in the farm home is that the former covers all production of the calendar year without duplication and makes allowance for production not regularly reported in the available statistical series.

[4] With a 1944 productivity rate, it has been estimated that the 1939 output could have been produced with 3 billion fewer man-hours, or a saving of 1.5 million man-years of work at 2,000 hours per worker. See, Sherman E. Johnson, *Changes in Farming in War and Peace*, FM 58, U. S. Department of Agriculture, June 1946.

one hand, farm production has been stimulated by continuous advances of technological improvements, mostly of the mechanical power variety; on the other hand, with exception of war years, demand for farm products has not advanced as rapidly, and in some instances has actually declined. Slowing down of the rate of population growth,[5] particularly among higher income groups, low elasticity of demand for farm products among middle and upper-income recipients,[6] chronic and periodic failures of purchasing power among a substantial number of domestic consumers, and an erratic and generally shrinking foreign market have retarded a progressive, and prevented a sustained demand for agricultural products. In this country, as in other industrially developed nations, the declining importance of agriculture as an employer of manpower appears to be closely associated with long-run forces operating in our economic society.

B. Postwar Agricultural Manpower Needs

It does not appear that factors making for greater efficiency in agriculture have run their course. Increases in farm productivity are expected to rise in the postwar years as much as or more than in the prewar years. Higher yielding plants and livestock and more labor saving and productive practices (increased use of fertilizer and lime, better soil management, etc.) are bound to continue in the years ahead.

It is generally expected that farming will be subjected to a widespread process of mechanization and re-tooling as soon as farm equipment manufacturers complete their reconversion from war to civilian production. Estimates indicate that "there will be about 460,000 additional tractors on farms in 1950.[7] Each additional tractor would save about 800 hours of manpower if it is used with appropriate tillage and harvesting equipment."[8] On the whole, we can expect a larger entrance of capital than of manpower into agriculture in the postwar years. This will be particularly true if high and stable economic activity prevails.

[5] See J. M. Brewster, "Farm Technological Advances and Total Population Growth," this JOURNAL, August 1945.

[6] See T. W. Schultz, *Agriculture in an Unstable Economy*, Part II, Ch. III, New York, 1945.

[7] Recent Farm Census data on the increase in the number of tractors on farms between 1940 and 1945 has necessitated an upward revision of this estimate to over 500,000 tractors by 1950.

[8] Sherman E. Johnson, "Improvements in Farm Technology and Their Effects on Farm Output," *Hearings Before the Special Committee on Postwar Economic Policy and Planning*, H. Res. 408, H. Res. 60, Part 5, 1944 and 1945.

There are no indications, moreover, that in the next 5 or 10 years, total demand for farm products will be much higher than they were at war-time peaks. In fact, there is some doubt that this demand will be sustained even if we reach and maintain a high pitch of economic activity and foreign markets hold up.[9] Yet, there is a studied opinion that "in the years ahead, war-time production levels will tend to persist regardless of economic conditions."[10] Historical precedent supports this position. During the 1929–1932 depression, the acreage of cropland planted was increased by about 12 million in an effort to maintain farm income to meet the 1919 incurred high fixed charges, and for living necessities. Between 1920 and 1939, a period of moderate agricultural demand and depressed farm prices, farm output increased 16 percent.

At best, it is conceivable that with an increase in population and a lifting of consumption standards here and abroad, a larger farm output will be required in the future.[11] But few will conclude that such larger demands will require expanding the Nation's farm plant or increasing the farm labor force. It has been estimated that "even with allowances for acreage needed for more adequate diets and increased consumption, the total planted acreage required with anticipated increase in production would not be above the average acreage of 340 million used for crops in 1935–1939."[12] Others have gone even further in their conclusions. Because of increased technological improvements, they maintain that the farm plant can

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[9] J. D. Black and C. D. Hyson predict that "by 1948, this country will definitely be on a food surplus basis, even with high-level employment." (See their paper, "Postwar Agriculture in the United States: Problems and Policies," in *Economic Reconstruction*, ed. by Seymour E. Harris, New York, 1945.)

T. W. Schultz maintains that "within one or the most two years after the war, farm prices are likely to recede from price ceilings that have held them in check, and many of them are likely to break through price floors set by the government." He further holds that "despite commitments by Congress to support market prices of farm products for at least two years after the war, farm prices may drop sharply . . . and are very likely to decline markedly relative to other prices as we make transition to peacetime economy." (See his book, *Agriculture in an Unstable Economy*, New York, 1945.)

[10] *Report of the Interbureau Committee on Post-War Programs at the War's End*, U. S. Department of Agriculture, September 27, 1945.

[11] Estimates show that "if output increased only at the same rate as population increased, the per capita domestic consumption of farm products would need to be stepped up about 10 percent above the level of the 1920's to absorb the total farm output." See, Sherman E. Johnson, *Changes in Farming in War and Peace*, FM 58, U. S. Department of Agriculture, June, 1946.

[12] *Farm Opportunities in the United States*, prepared by Land Settlement Work Group of the Interbureau Committee on Postwar Agricultural Programs, U. S. Department of Agriculture, July 1945.

afford a contraction of 18 million acres of cropland and yet meet the demand of a full employment market, plus a publicly financed nutritional program for low-income people.[13]

Thus, with future demand for agricultural products precarious in the face of a fairly certain maintenance of the levels of production achieved during the interwar years and World War II, it is not unlikely that the Nation's farm plant will find itself over-extended and its manpower not fully utilized.

Part Two—Farm Habilitation Perspectives

In the light of historical trends in agricultural manpower requirements and of the projected manpower needs in farming in the years ahead, what postwar perspectives are suggested to the Farmers Home Administration? In what follows, this question is dealt with under three headings: a) case-load perspectives; b) tenure perspectives; and c) statutory perspectives.

A. *Caseload Perspectives*

1. The Importance of the Economic Setting

To begin with, the basic approach must be placed in its proper historical economic setting. The farm habilitation program of the agency is entering a period which is not subject to an emergency psychology. The period immediately ahead is to be sharply contrasted with that of the 1930's, when rural rehabilitation programs operated within a generally depressed economy. It will differ also from that of the more recent period when such programs operated in a war-stimulated economy.

In each of the two periods in the past, the exigencies of the situation retarded the achievement of long-run objectives of farm and rural habilitation programs. Conditions in the next few years should favor the elevation of a number of currently disadvantaged low income family farms to higher and more lasting standards of operating efficiency and levels of living. Such an economic environment should provide an opportunity for making adjustments that would establish these families as independent producers, reasonably able to withstand another economic slump without public assistance.

Should our economy in the next few years operate at approximately the current or at higher production and employment levels,

[13] *What Peace Can Mean to American Farmers*, "Post-War Agriculture and Employment," Misc. Pub. No. 562, U. S. Department of Agriculture, May 1945.

three broad opportunities will be created favoring successful farm habilitation:

a. An opportunity for better selection of habilitation applicants.
b. Opportunities for non-agricultural employment for surplus farmers.
c. Opportunity for a start in the direction of a planned non-commercial family-farm program for that segment of the farm population for which a program of commercial farm habilitation is neither feasible nor desirable.[14]

2. Welfare and Production Efficiency

In our advanced economy, the potentialities of welfare rest on the foundations of production efficiency. This is as true of agriculture as it is of other industries. Economic equality for agriculture, it has been observed, "rests upon farmers' ability to produce the needed food and fibers at substantially lower costs—lower costs particularly in terms of the human resources involved."[15] All farmers must strive for the highest levels of production efficiency consistent with maintaining soil resources. Only if our entire agricultural plant operates at these levels of efficiency, will it be possible for farm people to enjoy incomes and services comparable to city living standards.

Agricultural planners are aware of the unbalance which exists within the farm industry, in that the bulk of the Nation's needs for farm commodities are today met by a comparatively small, but the most efficient, sector of agriculture. Agreement is general that agriculture should be encouraged to increase its efficiency more widely so as to enable all its producers to contribute more equally to the Nation's requirements. This is particularly applicable to the many disadvantaged low-income family-operated farms which today fail to compete in effectiveness with commercialized agricultural production. These less-efficient farms produce a standard of living nearer the subsistence level.[16]

It would seem that postwar agricultural adjustments lie along the following paths of endeavor: a) Mobilizing for efficient and profitable peacetime agriculture, particularly with respect to family

[14] This point is more fully discussed under a later section (Part III, Section C) on "Surplus Farmers."

[15] *Typical Family-Operated Farms, 1930–45*, An Historical Look to the Future, U. S. Department of Agriculture, April 1946.

[16] For fuller discussion of the survival prospects of family-operated farms, see O. R. Johnson, "The Family Farm," this JOURNAL, August 1944; W. W. Wilcox, "The Economy of Small Farms in Wisconsin," this JOURNAL, May 1946; and the author's article "Family Farm Perspectives," *Land Policy Review*, Spring Number, 1947, U. S. Department of Agriculture.

operated farms; b) Developing non-agricultural opportunities for a higher proportion of our working population; and c) Leaving only enough in commercial farming to produce abundant food and fiber by efficient methods.[17]

3. Selection Policy

What application have these broad agricultural perspectives to a program of economic and social habilitation of low-income farms and farm families in the immediate postwar period? Primarily, it would seem, they have a bearing on the decisions to be made respecting a selection policy.

These perspectives reflect the existence of a combination of forces[18] that are operating against the successful habilitation of family farms whose operations are quasi-commercial. They focus sharply the necessity for limiting the area of commercial habilitation to include only those family-operated farms which are not hopelessly disadvantaged under prevailing competitive conditions in agriculture. For only through such a carefully controlled selection would a postwar program of farm habilitation contribute toward broadening the efficiency of agriculture as a whole and toward reducing the number of its disadvantaged producers.

These broad perspectives indirectly suggest, also, the type of "farms" to be avoided under a program designed to lift family-operated farms to commercial efficiency. Many of the today's Census-designated farms are in reality small land holdings, and not family farms in the functional sense of the term. They are merely "furnish places" on the land for rural families who live as subsistence farmers or as workers employed primarily in other occupations. In 1945, about 1.4 million farms were in this class.

These holdings are not the type of units that can be easily habilitated by means of currently available techniques, even under the most favorable economic conditions. To attempt to lift these "farms" to a level of commercial efficiency is bound to be a long,

[17] For fuller treatment of these points, see *Postwar Agricultural Policy*, Report of the Committee on Postwar Agricultural Policy of the Association of Land-Grant Colleges and Universities, October 1944; *Farm Opportunities in the United States*, prepared by Land Settlement Work Group of the Interbureau Committee on Postwar Agricultural Programs, U. S. Department of Agriculture, July 1945; Sherman E. Johnson, *Changes in Farming in War and Peace*, FM 58, U. S. Department of Agriculture, June 1946.

[18] Technological advances that are reducing agricultural manpower needs, uncertainties in future demand for agricultural products, and the coexistence of these dynamic influences with a comparatively large number of uneconomic farm units and inefficient producers.

arduous, and dubious task from the viewpoint of achieving success. Moreover, it may prove to be not only too heavy a burden on an industry already overcrowded with marginal farms, but also a disservice to those farm families whose competitive position may not be sufficiently strong to survive despite all reasonable financial and supervisory assistance they may receive under a farm habilitation program.

This applies not only to the pseudo-family farms referred to above, but also to many other quasi-commercial family-operated farms. Their probable inability to respond quickly and favorably to habilitation assistance can largely be anticipated because contemporary farming is much more of a complex business than it was even a generation ago. Today, not only does it take a larger investment than in the past to become established on the size of farm that a family can easily handle from a labor standpoint, but it requires many more technical skills and much more management ability to successfully compete with units utilizing advanced farming methods and modern technology.

Through careful selection of applicants, however, a substantial number of operators of family farms can be found to meet the high qualifications for success demanded by the agricultural industry of today. Their present under-sized, undeveloped, understocked and under-equipped farms can be converted to efficient family farm units through timely extension of adequate long-term credit and through appropriate farm and home guidance designed to overcome their technical and management deficiencies. The actual number of such farms to be selected from among the applicants for habilitation assistance in each of the major agricultural regions of the country should be governed by the total number of producers necessary to be retained in commercial agriculture from the viewpoint of regional needs and of the Nation's and foreign market requirements.

B. *Tenure Perspectives*

The advantages of farm ownership have been well and validly established. Until recently, however, the disadvantages have been somewhat overlooked, or not sufficiently considered, particularly in connection with farm habilitation efforts.[19]

[19] The introduction of a new category of eligibles under Title I ("Tenant Purchase Loans and Mortgage Insurance") in the Farmers Home Administration Act, namely, "owners of inadequate or unimproved farm units," may be interpreted as a recognition that ownership of a farm is not necessarily accompanied by favorable economic attributes.

Too frequently farm ownership has meant legal title to an uneconomically-sized and technologically backward farm unit located on poor land. Farm ownership, in such cases, has not led and cannot lead to farm security. Much evidence exists that farm ownership, in many cases, has been achieved at too steep a price—that is, at the expense of adequate farm units, of denial of necessary means of production, of insufficient earning capacity and of low living standards. Farm ownership arrived at with limited capital, especially in the case of family farms, can be as fundamental a cause for disadvantaged status and farm insecurity as can inferior tenure.

It would follow, therefore, that the important consideration in the habilitation of low-income family farms should be a de-emphasis on tenure patterns *per se* and a greater stress on improving the economic adequacy and on raising the operating efficiency of these farms so as to enable them to enjoy equal competitive advantages at each of their respective tenure levels. Only where a close relationship is found to exist between economic advantages of farm operations and tenure patterns should the latter be given special consideration in programmatic action directed at habilitating disadvantaged family farms.

There is one other merit for this perspective. It is evident that not all farms can be owner-operated. Other types of tenure will persist, and many in agriculture will probably have neither ownership nor tenancy status at all. Overstressing farm ownership tenure has a tendency to promote an indifference to conditions of farm people with other types of tenure or with no tenure at all. It has a deterring effect on efforts to better adjust farm families within their present tenure status. Our thinking and planning should be adjusted to the view that there is room in our agricultural economy for the development of various types of land tenure, provided all units at all tenure levels are economic in size and efficient in operation and management. Such a perspective need not lessen efforts to promote farm ownership of family-operated units.

C. *Statutory Perspectives*

Title I ("Tenant Purchase Loans and Mortgage Insurance") of the Farmers Home Administration Act specifically describes the type of recipients who are eligible for the direct and insured loans, namely: "only farm tenants, farm laborers, sharecroppers and other individuals (including owners of inadequate or underimproved farm units) who obtain, or who recently obtained, *the major portion of*

their income from farming operations." Congressional emphasis on establishing efficient economic farm units is further evidenced by the provision that "no loan shall be made, or mortgage insured, for a) the acquisition, b) improvement, or c) enlargement of any farm unless it is of such size and type as the Secretary determines to be *sufficient to constitute an efficient family-type farm-management unit* and to enable a diligent family to carry on successful farming of a type which the Secretary deems can be carried on successfully in the locality in which the farm is situated."

With the exception of the additions to this title indicated earlier,[20] both of these provisions in the Act have been carried over from the Bankhead-Jones Farm Tenant Act of 1937 and are not, therefore, an innovation in this type of legislation. They nevertheless assume sharper significance in terms of Congressional intent and Administrative execution because prevailing economic conditions are more favorable to their successful application than was formerly the case.

Interpreted against the current economic background, one might draw the following conclusions respecting the above two provisions under Title I of the Act: That they represent a Congressional mandate that no habilitation assistance is to be extended unless the would-be habilitant already has a farm, or can acquire a new tract, or can enlarge or add to his present farm acreage so as to possess a sufficiently large and potentially productive land base on which to attain operating efficiency, if certain other farm and management deficiencies were corrected. Conversely, it may be interpreted as discouraging efforts to habilitate families on potentially unproductive and uneconomic farms. The inference is strong that the authors of the statute were of the opinion that the administrative agency should continue to avoid setting up borrowers under conditions which in the past contributed toward chronic poverty on the farm.

It is particularly pertinent to recall today the findings of the Special Committee on Farm Tenancy made some ten years ago:

> "Impoverishment, resulting from the operation of unduly small units, gives rise to forces which tend to perpetuate the problem. The elaborate systems of public aid which have been built up in recent years tend to overcome the operation of economic influences that would otherwise cause abandonment or liquidation of the weaker small units and thereby permit their consolidation with others. Public aid, thus administered, therefore tends to perpetuate farming on uneconomically small units, as well as on poor land."[21]

[20] See footnote 2.

[21] *Farm Tenancy*, Report of the President's Committee, February 1937.

Title II of the Act ("Production and Subsistence Loans"), the other substantive provision in the statute, does not present a problem in perspectivel In essence, the program to be conducted under it is designed to meet either future emergency conditions or to serve immediate production and subsistence needs involving treatmentof short-run factors. With the exception of eliminating the authority for making "grants" and substituting in its place the authority for making only "loans" in such cases, this title does not differ substantially from the short-term aspects of previous rural rehabilitation activities of the Resettlement and Farm Security Administrations.[22]

Part Three—The Area of Farm Habilitation

A. The Over-all Area of Responsibility

A basic question now arises: How many family-operated farms which currently are operating on or below the margin of profitable commercial production should be raised to the level of competitive efficiency as our economy returns to normalcy in the next few years? The answer to this question poses the fundamental approach to a postwar farm habilitation program.

The first step in the pursuance of this approach would be to draw the correct conclusions from the presentation developed in Part I of this paper. They can then be used as guideposts in delimiting the potential area of farm habilitation. These conclusions may be set down as follows:

1. Under present farm technology and with anticipated increase in power mechanization and in other improvements, it appears likely that a smaller rather than a larger labor force will be needed in full-time farming in the years ahead.
2. The Nation does not need now and probably will not need in the immediate future any large amount of additional farm land to meet its agricultural requirements.
3. The number of people that agriculture can readily absorb in the postwar period, even under the most advantageous economic conditions, will be somewhat short of the number of those who will withdraw from farming. As a result, the agricultural industry will not be in the position to offer large-scale occupational and employment opportunities. This will apply not only to newcomers, but also to the young people already on farms who will become occupationally mature for independent farming.[23]

[22] In the current statute, the term "rural rehabilitation" and the concept of "needy" farmers are deleted. The Bankhead-Jones Farm Tenant Act of 1937 and previous annual appropriations acts included them.

[23] Estimates indicate that about 300,000 replacements (young people reaching

4. Technology, specialization and better operating and management practices may be expected to increase the size of the typical family farm and make it a more balanced and profitable organization. As such farms are enlarged, primarily by the process of combining small units, the number of full-time family-type farms will decrease.
5. In the light of efficiency trends in agricultural production, postwar opportunities for commercial farming on uneconomic units, with backward technology and with poor management practices are indeed dismal.

Within the framework of these conclusions it is possible to arrive at a more precise answer to the numerical problem raised above. Recent estimates indicate that the American population in 1950, producing a net national income of 150 billion dollars, could be amply supplied with the required food and fiber by an agricultural labor force of about 8 million.[24] This would constitute a reduction of about 2.5 million from the 1940 average and 1.8 million less compared with 1945.

Assuming the present ratio of about three operators and unpaid family workers to one wage laborer, the agricultural manpower in 1950 would consist of 6 million farm operators and unpaid family workers, and a monthly average of about 2 million hired laborers. If, furthermore, an average of 1.5 to 2 full-time workers per farm unit is assumed, exclusive of hired workers, a total of between 3 and 4 million commercial farms would comprise the farm plant of the Nation that year.

If the number of adequate commercial farms (both family and non-family operated) at the most recent Census could be determined, it would be possible to ascertain, out of the total number of commercial farms reported for the Nation as a whole, those which were operating at or below the margin of profitable production. A refinement could than be made of this potential area of habilitation in the light of the estimated agricultural labor force, and in accordance with the perspectives suggested in Part II.

To follow this procedure, it is necessary to arrange the Nation's farms according to one or more criteria which would reflect their economic position in the agricultural industry. The farm classifica-

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the age of 25) will be potential competitors for the 180,000 vacancies a year during the decade 1940–1950, or about 1.7 men for each vacancy. Cf. C. Taeuber, *Replacement Rates for Rural-Farm Males Ages 25–69 Years, by Counties, 1940–1950*, U. S. Department of Agriculture, December 1944.

[24] *What Peace Can Mean to American Farmers*, "Postwar Agriculture and Employment," Misc. Pub. No. 562, U. S. Department of Agriculture, May 1945.

tion described in Table I is based on the gross value of production at 1944 prices. This index reveals the production strength of farm units, and indirectly reflects their available basic and collateral means of production.[25] In a general way, also, it indicates the imponderables associated with farm standards of living.

Using selected values as breaking points, the rough outlines of the American farm plant in 1945 appeared as follows:

I. The Major Commercial Farm Sector: about 1.9 million adequate farms.
II. The Minor Commercial Farm Sector: about 2.5 million low production farms.
III. The Non-Commercial Farm Sector: about 1.4 million submarginal, subsistence, part-time, residential, and retirement units.

It is submitted that the over-all potential area of postwar farm habilitation is comprised of those "low production commercial farms" indicated in Class II above. If this area is restricted to those farms which in 1944 produced *primarily for the market*, the actual number within this class equaled about 2.1 million units in 1945. At the 1944 level of prices, the output of these farms had a value between $600 and $2,499.

In setting $2,500 gross value of production as the upper limit and $600 as the lower limit for farms which would be in need and worthy of habilitation assistance in the postwar years, these assumptions were made:

1. It was assumed that a farm which at 1944 prices did not have an output value of at least $600 was operating with insufficient land, capital, equipment, motive power, and possibly inadequate or handicapped manpower—or had no intention to produce for the market. This assumption is supported by the fact that the 1.4 million farms with a reported output of less than $600 contributed much less to the total national output of agricultural commodities than their numerical ratio in the farm industry. They constituted one-quarter of the total Census farms, but produced only 2.5 percent of the Nation's output.

Those 1.4 million farms sell too little to furnish an adequate living from farming or to maintain their farm enterprises. It is not likely that many of these farm families can support themselves without deriving their major income from off-farm employment. With some exceptions, they do not represent farms which might be

[25] It may be reasonably assumed that this was practically their maximum production ability in view of the all-out effort made during the war.

TABLE I. CLASS DISTRIBUTION OF FARMS IN THE U. S. IN 1945. BASED ON GROSS VALUE OF PRODUCTS AT 1944 PRICES

Descriptive class[1]	Number (000 omitted)	Percent	Value of products (000,000 omitted)	Percent	Average value of product per farm (dollars)	Percent value of products sold at total value	Value groups
	1	2	3	4	5	6	7
I. Major Commercial Farm Sector	1,944	33.8	14,397	79.5	7,406	94.5	$ 2,500 and over
A. Large Scale Non-Family Farms	289	5.0	6,517	36.0	22,550	97.9	$10,000 and over
B. Medium and Large Scale Family Farms	1,655	28.8	7,880	43.5	4,761	91.6	$ 2,500–9,999
II. Minor Commercial Farm Sector	2,407	41.8	3,260	18.0	1,354	75.3	$ 600–2,499
A. Small Scale Family Farms	909	15.8	1,768	9.8	1,945	81.6	$ 1,500–2,499
B. Semi-Commercial Family Farms	1,498	26.0	1,492	8.2	996	67.9	$ 600–1,499
III. Non-Commercial Farm Sector	1,402	24.4	451	2.5	322	38.4	Less than $600
A. Subsistence and Part-Time Farms	948	16.5	388	2.1	409	40.2	$ 250–599
B. Residential, Retirement and other Nominal Farms	454	7.9	63	0.4	139	27.0	$ 1–249
U. S. (Classified) Total	5,753	100.0	18,108	100.0	3,148	85.2	All Values

Source: 1945 Census of Agriculture.

[1] The descriptive classes associated with the indicated value groups are based on two criteria: (a) The degree of commercial operation conducted by the farms as a whole within each of the value groups; (b) the aggregate production value of these farms related to their numerical strength in the U. S. total.

Thus, all farms which sold at least 50 percent of their output by value are considered commercially operated in varying degree. If they sold at least 90 percent of their output, they are classified as commercial in a major degree. If they sold 75 percent but less than 90 percent of the output, they were assumed to be small-scale commercial farms. Semi-commercial farms are those that sold more than one-half but less than three-quarters of their product. Those which sold less than 50 percent of their output are grouped in the non-commercial sector. The output of the farms was assumed to be either sold or consumed on the farm, and that an effective choice existed as to the disposition of the product.

It is recognized that the descriptive classification is not perfect. Undoubtedly many of the farms in IIB (semi-commercial) may be classed as part-time farms under IIIA; also, a number of the 289,000 here described as "non-family farms" (under IA) are probably family-operated units. A number of other adjustments can probably be made to improve the descriptive classification.

raised to a level of paying efficiency without extraordinary effort and over a relatively long time.

2. It was assumed that a farm which at 1944 prices produced a value of at least $2,500 succeeded in doing so only with sufficient land and equipment, and with the family working members effectively employed on the farm. This status applied to the approximately 1.6 million farms, largely of the family-type, which averaged about $4,700 in gross value of products. It applied also to the nearly 290,000 farms, many of the non-family type, which produced no less than $10,000 in value and averaged almost $23,000 in gross income. These 1.9 million farms represented one-third of the U. S. total Census farms in 1945, but contributed four-fifths of the Nation's farm products by value.

On the basis of this record, the presumption is strong that these

1.9 million farms are profitable, going concerns. They probably possess the resources, the operating know-how, and the managerial ability to be able to produce a volume of agricultural commodities which at fair and stable prices would yield incomes sufficient for good living, for needed operating expenses, and for an ample margin of profit to maintain or raise net worth. It would appear that not many farmers in this sector would generally be in need of the type of habilitation assistance contemplated for disadvantaged low-income family farms under the Farmers Home Administration Act of 1946, nor would any substantial number of them be eligible under its provisions.

3. Eliminating the above 3.3 million farms as being beyond the desirable or practical scope of a farm habilitation program for principally commercial family farms, there remain about 2.4 million farm units which may fall under the provisions of the Farmers Home Administration Act. Some 367,000 farms in this total are units which produced primarily for home consumption and which, by the standards of selection assumed here, should be omitted from consideration for habilitation. This leaves about 2.1 million low-income family farms to represent, as previously indicated, the over-all target area for habilitation treatment in the postwar period.

This over-all target area is composed of two segments: a) the 911,000 farms which in 1944 produced a gross value of farm products between $1,500 and $2,499; and b) the approximately 1.2 million units with a gross value of output between $600 and $1,499. (See Table II.)

A large majority of the 885,000 units in the first segment man-

TABLE II. SUGGESTED MAXIMUM AREA OF RESPONSIBILITY AND ESTIMATED POTENTIAL CASELOAD UNDER A FARM HABILITATION PROGRAM IN THE POSTWAR PERIOD

Descriptive class and value group	Average value of output in 1944	Number of farms in 1945	Farms which produced primarily for sale in 1944		Estimated potential caseload	
			Number	Percent	Number	Percent
	1	2	3	4	5	6
1. Small Scale Family Farm ($1,500–2,499)	$1,945	909,000	885,000	97	708,000	78
2. Semi-Commercial Family Farm ($600–1,499)	996	1,498,000	1,181,000	79	886,000	59
3. Subsistence and Part-Time Farms ($400–599)	489	514,000	228,000	44	57,000	11
Total ($400–2,499)	$1,202	2,921,000	2,294,000	79	1,651,000	57

Source: 1945 Census of Agriculture.

aged to stay above the margin of production only because of extremely favorable price relationships which existed between 1940 and 1944. It is questionable whether at long term agricultural prices their limited production resources and facilities would enable them to continue to produce an average gross income of about $1,950 (which they did in 1944), permit them to improve net worth, and take adequate care of family living.

The eligibility for habilitation of the 1.2 million farms in the second segment is even more apparent. At the high 1944 price levels for agricultural commodities, the best that these units could do was to avoid falling below $600 in value of output. None of them reached a level of production as high as $1,500.

It is not unreasonable to conclude that the farms which that year were able to show for their labor and investment an average gross value of only about $1,000 were definitely operated by marginal producers. Since about one-third of their production was consumed on the farm, the average farm family in this group had a cash farm income of about $700 with which to meet operating expenses, retire debts, accumulate savings for repair and depreciation, and at the same time provide for the living needs of its members. The marginality of these farms is reflected in the further fact that their aggregate contribution to the U. S. total value of agricultural production in 1944 was only 8 percent, although they comprised more than 25 percent of the Census farms.

It is evident that these farms did not have the combination of productive resources of land, labor, capital and working equipment to conduct a well-integrated family farm on a full commercial scale. Most of them probably suffered also from poor management and had an insufficient land base or land too inferior to permit most efficient operation. At best these farms operated on a semi-commercial basis, supplemented by cash income from off-farm employment. It was this supplemental income, coupled with the high level of farm prices in 1944, that probably enabled many of them to maintain their net worth and kept them from sinking below prevailing minimum living standards.

B. *The Potential Caseload*

How many of these 2.1 million low-income family farms will it be feasible to select for purposes of conversion into adequate-sized, modernly equipped and well-managed farms? It is evident that the

actual potential caseload would be somewhat less than this total. How much less will depend on the aggregate number that may be ruled out because of the policy and administrative decisions of the agency, and the number that may not desire the kind of assistance that the agency is prepared to offer. Below are a number of possible categories in which such farms may be found:

1. Applicants over a certain age level, say over 55 years;
2. Applicants who are not full-time farmers as evidenced, for example, by the number of days worked off the farm per year, or who do not obtain or recently have not obtained the major portion of their income from farming operations;
3. Applicants who may be discovered to have ability to obtain credit from existing conventional lenders, who might be better aided by the agricultural extension services, and those who will not apply for habilitation assistance;
4. Applicants having too few family workers to reach a level of operating efficiency on a family sized farm;
5. Applicants having land and other physical resources too inadequate to constitute an efficient family-type farm-management unit for successful farming on their present location;
6. Applicants otherwise considered not capable of reaching an efficiency level of commercial farm production, or, because of their extremely disadvantaged situation, of reaching such a level only after a prolonged period of assistance;
7. Applicants who may not have the intent nor the desired attitude toward full-time farming or who may not be capable, because of lack of experience or otherwise, of responding to proper guidance and supervision to become successful independent producers.

Assuming that the above types of cases will contract the agency's maximum area of responsibility by about 20 percent in the $1,500 to $2,499 class and by about 25 percent in the $600 to $1,499 bracket, the potential caseload would consist of about 708,000 farms in the first bracket and some 886,000 in the second, or an aggregate of 1.6 million farms. Should the agency choose to dig deeper and take, say 25 percent of the 228,000 farms estimated to have had an output of less than $600, but not lower than $400, and which produced primarily for sale, 57,000 farms may be added to the potential caseload. This would bring the total up to about 1,650,000 farms. (See Table II.)

With about 1,650,000 family farms ear-marked for habilitation in the postwar period, added to the 1,944,000 currently adequate farms, the American farm plant would be remodeled to consist of about 3.6 million units well-managed and operated, and well-

endowed with the basic resources and modern technology of production. They should be able to meet the requirements of a peacetime and reasonably stable economy, and provide the Nation's needs of farm products and those for export.

C. *Surplus Farmers*

A remodeled farm plant comprising 3.6 million efficient production units would leave about 2.2 million surplus "farmers." Less than one-half million (see Table I) of this surplus represents farms only in the nominal sense. Most of them are merely rural residences and country estates with an output of less than $250 of farm products in 1944. For purposes of an over-all family-farm habilitation program these may be eliminated from consideration. The large majority of the remaining 1.7 million farms would represent producers not essentially needed in a postwar agricultural industry geared to efficiency.

Practically all of these surplus farms are today either subsistence, part-time or semi-commercial farms which are beyond practical prospects of conversion into efficient economic units of a self-sustaining character. The families on these units subsist on a very low level of income and at a very low level of employment. Many of the social problems in agriculture associated with poor nutrition, bad health, inadequate housing and substandard education are concentrated on these farms. Their economic difficulties will be aggravated as mechanization and other improvements in the technology of agriculture advance still further.

Some form of publicly supported program will be required to effect an adjustment of these 1.7 million families in the American economy. These farms comprise 5 or more million farm people—surplus for the purpose of an efficient agriculture. In planning such adjustments, the existence of several categories of this surplus should be recognized:

a) Families who will wish to remain on the land on self-contained subsistence farms even though that will mean a depressed standard of living with little or no cash income from farming.
b) Families who will want to dovetail their meager farm operations with non-agricultural employment.
c) Families who will reconcile themselves to the status of wage earners in agriculture and in odd-jobs for the sake of retaining residence in farm and rural areas.
d) Families who will be faced with migration from the land.

For the first three categories, consideration might be given to the feasibility of a non-commercial farm program. Such a program might conceivably take two forms: a) an economically-adequate subsistence farming and farm labor program; b) a controlled part-time farming program.

Perhaps some 700,000 surplus farm families can be adequately taken care of by a non-commercial farm program along the lines suggested. This would leave about a million farm families to be encouraged and guided to seek non-agricultural livelihoods either through conscious public and private effort or through normal absorption in an expanded postwar national economy.

The economic compulsion for an out-migration program stems not only from the present existence of a surplus of farmers, but also from the dynamics of farm population. It has been evident for some time that the rural segment of our population more than reproduces its own numbers for effective utilization in agriculture. In the next few years, as has been indicated, the major source of surplus manpower on the land is expected to come from replacements who will outnumber the available vacancies almost 2 to 1.

The success of a postwar farm habilitation program for the estimated 1.7 million potentially qualified and eligible low-production family farms will depend upon what happens in the non-agricultural sector of our economy. The development of industries, particularly in rural areas, and the expansion of employment opportunities for a substantial portion of the farm population in urban areas are just as essential for a technologically progressive agricultural industry and for rural prosperity as the retainment of a sufficient number of efficient producers in farming.

Conclusions

American agriculture has reached the stage of functional efficiency at which it can meet its economic obligations to the Nation as a supplier of food, feed and fiber with a comparatively small number of farmers. This augurs higher standards of consumption for the Nation's population and higher levels of living for agricultural producers—provided, however, this achievement in functional agricultural efficiency is translated into national welfare; and provided, further, that it is spread more uniformly over our entire farm plant.

The successful translation of agriculture's functional efficiency

into welfare terms requires the recognition of a) agriculture's achievements in production efficiency, b) the social consequences of that efficiency and c) the corresponding adjustments required in the light of these consequences.

As a result of the greater emphasis that will be placed on efficiency in farm production in the coming years, tending to make agriculture increasingly a commercial occupation, large scale readjustments in farm manpower are inevitable in the postwar period. Decisions will have to be made respecting the kind of farms we shall retain, the number we shall need, and the volume of labor that will be required to produce the Nation's needs of agricultural commodities. Such adjustments are of particular concern to any public agency charged with the responsibility for habilitating disadvantaged family-operated farms.

To an important degree, the continuance of the prevailing high tempo of the Nation's total economy will depend on what success we have in maintaining full production and employment in the non-agricultural sector. For "unless ways are found to solve the industrial postwar problems, what we do on the agricultural side will make little difference."[26] Should such solutions be found and applied, and should the expectant result materialize, conditions would be exceedingly favorable to apply in full measure the more fundamental provisions of the Farmers Home Administration Act of 1946 which are under Title I.

A family farm habilitation program in the next few years holds a promise of reasonable success only if the national and international economic climate is favorable to permit the pursuance of an approach which would a) stimulate needed and overdue long-run reforms in our farm economy and b) avoid perpetuating the present maladjustments in agriculture.

In large part, the Congressional mandate for undertaking this task is today firmer than it was in the past. For the first time, one of the principal agencies charged with its fulfilment, the Farmers Home Administration, has been given a statutory basis for existence. Time will tell whether it has been equipped with all the necessary tools to do the job successfully.

[26] M. Ezekiel, "Agricultural and Industrial Problems in Conversion from War to Peace," *Economic Reconstruction*, Ed. by Seymour E. Harris, New York, 1945.

NOTES

STATUS OF FEDERAL LANDS

PUBLIC officials and the general public have considerable interest in the extent, character, and use of the publicly owned and administered lands in the United States. This article is primarily concerned with an over-all discussion of the ownership and use status of Federal lands,[1] with brief consideration of events leading up to the present situation and some observations on public land problems.

Of the 1,905 million acres of land within the United States, approximately 560 million acres, or about 29 percent, is now in public ownership. Of the land in public ownership, about 458 million acres, or 82 percent, is in Federal ownership; the remaining lands—in the neighborhood of 100 million acres—are owned by State and local governments.

Ownership of Federal Lands

Altogether the Federal Government acquired, by grant, purchase treaty or conquest at various times some 1,400 million acres of

TABLE 1. DISPOSITION OF THE ORIGINAL PUBLIC DOMAIN LAND IN UNITED STATES

Method	Acres
	(Millions)
Patented to homesteaders	285
Granted to States	225
Granted to railroad corporations	90
Sales and other disposals	392
Total land disposals	992
Present public domain	408
Original public domain	1,400

public domain land. There never was any public domain land in the original 13 States and Texas. About 39 million acres in grants and claims of citizens of Louisiana Territory, California, and New Mexico were recognized by the United States Government after accession of these territories. Through sale, grants, preemption and homesteading, all but 408 million acres of the 1,400 million acres has been disposed of primarily for land settlement, internal de-

[1] All statistical data used in this manuscript compiled by the Division of Land Economics from the records of various Federal agencies.

velopment, and as a source of revenue. Table 1 gives a summary of the methods used in the disposal of the original public domain land.

Throughout our land policy deliberations there has been an underlying attitude, with but few exceptions, that individual self-interest expressed through private land ownership would bring about the maximum production of wealth and the highest degree of social welfare in the use of our land resources. Occasionally a protest was raised against the laissez faire doctrine as applied to public lands, but these were futile in view of the dominant spirit of the pioneer to secure free land. About 71 percent of the land in the United States has passed into private ownership and, except for occasional tracts, the remainder of the original public domain is largely ill-suited to private ownership. Nearly all the land suited for private ownership was homesteaded under the various homestead acts or sold before entries were withdrawn.

It is indeed fortunate that we as a Nation had so much good land available for settlement, for this was a real force in the development of strong democratic governments. However, in the disposal of so many different types of land as existed within the public domain it is not surprising that a substantial acreage that was neither physically nor economically adapted to arable agriculture passed into private ownership.

During the nineties and the first decade of the present century, concern over the increase in population and the dwindling resources led to the setting aside, from time to time, of public domain land for public purposes. For instance, in 1891 we forbade further sale of land and began to reserve public land for timber purposes. This was the forerunner of the first conservation movement under the leadership of Theodore Roosevelt and Gifford Pinchot. Furthermore, measures to reclaim swamp land and irrigate millions of acres of dry land were energetically promoted.

In addition to the public domain, the Federal Government has acquired about 50 million acres by purchase, gift, and similar processes. Much of this land was in the nature of submarginal farm land acquired by the Federal Government during the thirties, in part for the purpose of relieving the impoverishment of agriculture and rural life in numerous areas. These purchases were further motivated by the need for building up our land resources, particularly forest and grazing lands, recreational developments, and needed

watershed protection. At that time, a very significant force in arousing interest in land purchase programs was the thousands of acres of land that were reverting to State and local governments through tax delinquency. This problem was serious enough between 1925–1940 to give rise to the term, "the new public domain." During World War II, seven million acres of land were purchased by the Government for military uses. Of this land about 1.5 million acres have been declared surplus and are in the process of disposal. Another million acres is leased to farmers for temporary use.

Land originally in public domain, including Indian lands, comprises approximately 90 percent of the present total Federal holdings. The other 10 percent was obtained, primarily from private owners, under various acquisition programs. Public domain land and acquired lands are quite distinct in certain administrative respects and in the application of public land laws, and must be considered separately in any over-all study of Federal land utilization and management.

As indicated by Figure 1, the great bulk of the Federal land is in the eleven Western States. It is not suited to arable farming except where relatively small areas may be reclaimed. Six States have over 50 percent of their area in Federal land; 34 States show less than 5 percent Federal land, of which 11 States have 1 percent or less.

From 1920 to 1930 public land ownership declined. About 40 million acres were taken up in homesteads, although much of this land was not suited to private ownership. During the depression of the thirties, there were many failures and much farm abandonment both in the public land States as well as in the Eastern States. During the period from 1930 to 1940 the increased interest in public purchase led to the acquisition by the Federal Government of about 25 million acres, and several million acres by the States and counties. Beginning in 1939 and continuing to the present (1947), the Federal Government has sold a considerable acreage of land acquired in the thirties for resettlement purposes; and the States and counties have disposed of approximately 75 percent of land they had acquired through tax reversion and defaults on loans through State land and farm credit agencies.

The acreage of public domain land and of acquired lands held by each of the 13 principal Federal administering agencies in 1945 is shown in Table 2.

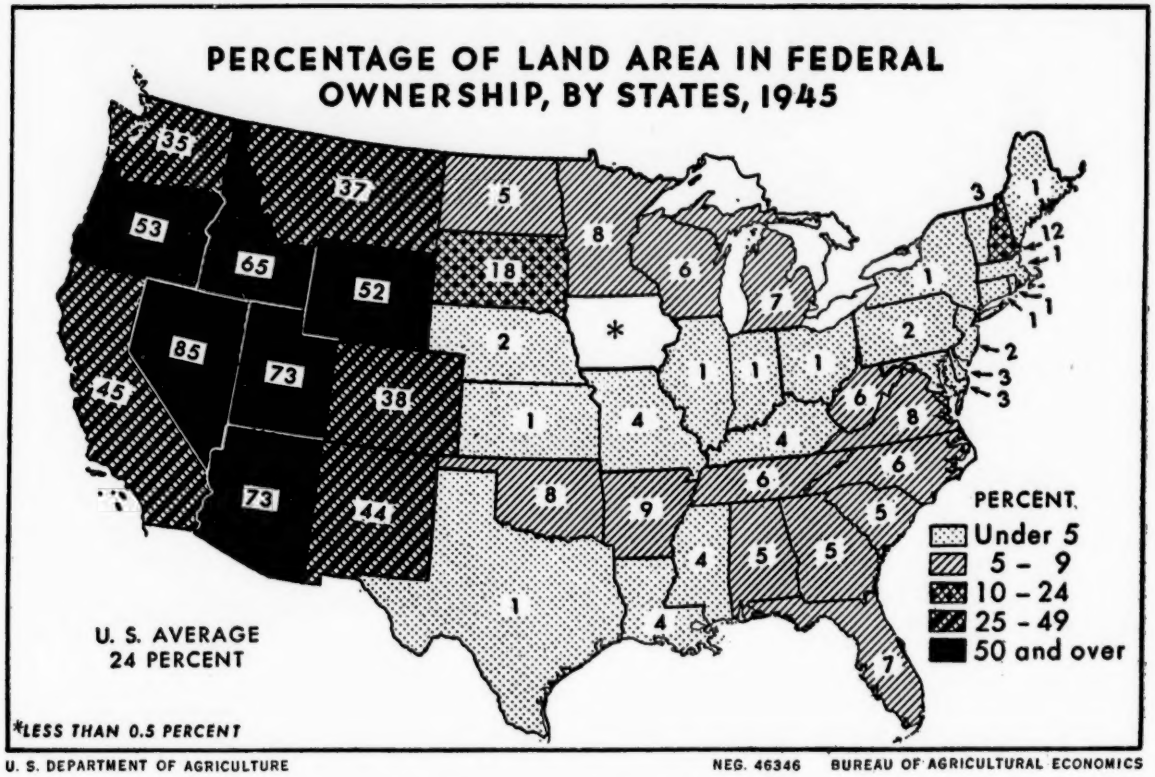

FIG. 1.—Federal land ownership, by States, 1945.

TABLE 2. AREA OF PUBLIC DOMAIN AND ACQUIRED LANDS, BY FEDERAL ADMINISTERING AGENCIES, 1945

Administering agency	Public domain land		Acquired lands		Total	
	Acres	Percent	Acres	Percent	Acres	Percent
Bureau of Land Management	180,353,766	44.2	0	0	180,353,766	39.4
Forest Service	134,087,148	32.9	23,793,083	48.0	157,880,231	34.5
Office of Indian Affairs	54,905,260	13.5	1,671,366	3.4	56,576,626	12.4
National Park Service	11,569,477	2.8	2,032,712	4.1	13,602,189	3.0
Bureau of Reclamation	9,238,851	2.3	643,553	1.3	9,882,404	2.2
Soil Conservation Service	258,334	0.1	7,217,970	14.5	7,476,304	1.6
Fish and Wildlife Service	2,194,400	0.5	2,462,481	5.0	4,656,881	1.0
Farm Security Administration	116		541,569	1.1	541,685	0.1
War Department	14,670,672[1]	3.6	8,764,671[2]	17.6	23,435,343[5]	5.1
Navy Department	561,497	0.1	1,146,098	2.3	1,707,595	0.4
Agricultural Research Administration	104,426[4]		28,159	0.1	132,585	
Tennessee Valley Authority	1,308		1,123,669	2.3	1,124,977	0.3
Other agencies[3]	70,211		150,003	0.3	220,214	
Total	408,015,466	100.0	49,575,334	100.0	457,590,800	100.0

[1] Includes public land transferred by other Federal agencies.
[2] Includes approximately 2½ million acres flood control and military lands held before the war, 5.6 million acres purchased from private owners during the war, and over ½ million acres of donated and acquired lands transferred from other Federal agencies.
[3] Includes Departments of Justice, Commerce, State, and Treasury, and independent offices.
[4] Less than .1 percent.
[5] Excludes a substantial acreage of public land used under temporary permit.

The Forest Service, Bureau of Land Management, and the Office of Indian Affairs have jurisdiction over about 86 percent of the Federal lands. In general, the primary uses of Federal lands are indicated by the administering agency. However, considerable areas of land are used in two or more ways simultaneously. For instance, in a single area one may find grazing, forestry, recreation, fish and wildlife propagation, and a watershed for municipal or irrigation use. This multiple use of land is often a characteristic problem of public land management.

Primary Uses of Federal Lands

The type and intensity of uses of Federal lands are conditioned by the physical characteristics of the different types of land, their location and the general level of economic activity in the United States. For instance, much of the land used for grazing is at high elevation, dry or arid in character, and parts of it, at times, subject to extreme variations in rainfall. A major part of this land is used in connection with private farms and ranching units which often have valley or irrigated lands that supply much of the winter feed. The interdependence of private and public lands in the range sections of the West requires coordination and considerable cooperation between Federal agencies and private users, particularly where

there is danger of overstocking during certain periods. Much of the publicly held land is used in private enterprises as freely as if it were in private ownership. And if forest land and other critical watershed areas were in private ownership, one could not expect private owners to use it in such a way that watersheds would be protected for the owners of lands dependent upon the protected watersheds.

Table 3 shows the approximate present area and percentage distribution of Federal lands in crops, forestry, grazing, service areas, and barren and swamp land.

TABLE 3. PRIMARY USES OF FEDERAL LANDS, 1945[1]

Use	Area	Proportion of area
	Million acres	Percent
Cropland[2]	4	0.9
Forestry (excludes forested areas reserved for parks, recreation, military, wildlife, and water supply areas)	146	31.9
Grazing (excludes forest lands grazed and open land reserved from grazing for special purposes, i.e., parks, etc.)	202	44.1
Service areas (principally special reservations as follows: parks and recreation areas, 26; military reservations, 23; reservoir and water supply areas, 12; wildlife refuges, 4; and other service, 1 million acres)	66	14.4
Barren land, brushland, swampland, and other land	40	8.77
Total Federal land	458	100.0

[1] Surface utilization only. Large areas have additional value for minerals, etc.
[2] A large part of cropland lies in Indian reservations.

About 14 percent of all Federal lands are reserved primarily as "Service" areas—parks, recreation areas, military lands, and other similar uses. Although within these areas such uses as forestry and grazing are often practiced, these uses are subordinated and controlled to the benefit of the primary use. Outside these reservations, the area of Federal lands used for forestry is about 146 million acres or about one-third of the total, and for grazing slightly over two-fifths.

The major part of the forest land is in national forests and considerable acreages are in vacant public domain areas and Indian reservations. Relatively small areas are in national parks or in combination with some other use. These lands serve not only for timber production but for grazing, recreation, and the production of wildlife and watershed protection. Twenty-seven percent of the Federal lands used for grazing are administered by the Forest Service.

There is need to keep current an inventory of the ownership and use of all public lands. This information is now scattered among a host of Federal and State agencies and often is not even kept up to date in tabular form. Furthermore, as a step in the management and development of public lands more information is needed on the characteristics and use capabilities of different types of land.

Land Use Problems

During the twenties and early thirties, farm surpluses, submarginal land use, tax delinquency, farm foreclosures and other serious rural problems arose. To meet these social maladjustments, programs were evolved for crop acreage control; soil, forest and water conservation; farm-home ownership; liberalized credit; farm mortgage moratoria, homestead tax exemptions, submarginal land purchase. The public domain was practically closed to further settlement. Grazing associations and soil conservation districts were established as devices to develop orderly and efficient use of land. Legislation was enacted in more than a dozen States, enabling local units of government to zone rural lands. Such are some of the features of the land program of the thirties.

In regard to Federal lands, there is now an active demand for legislation directing the sale of much of the remaining public domain and acquired lands, the transfer of the public domain to State ownership, or for the transfer of special privileges, such as grazing permits, into vested rights of private individuals or of groups. Funds for the management of grazing lands have been drastically cut. Although land policies are rooted in the past, they are very much affected, at any given time, by the economic conditions to which they are exposed. One might now surmise from these demands and restrictions that all our public land problems would be solved, provided the Federal Government would dispose of or be restricted in the control of its lands. Obviously, it cannot be taken for granted that Federal ownership of land in itself assures sound land use or always necessarily means the adoption of forward looking land policies. The early disposal programs were, according to Hibbard, "inextricably interwoven with politics," and fraud and speculation were common. However, under conditions that existed, the Federal Government has done a pretty good job in the disposal, management and administration of its lands. Especially during the past 15 years very significant progress has been made in the management and development of Federal lands.

There are scattered and isolated tracts of the public domain that might better be in private ownership. But the great bulk of this land is better suited to public than private ownership because: (1) low and variable annual land incomes make private ownership very hazardous—the situation, for example, that exists in grazing areas; (2) the high risk and deferred income characteristic of land uses, such as forestry, in areas of low productivity; (3) the existence of a situation, as in recreational and watershed protection areas, where government, acting for society as a whole, undertakes obligations that private individuals cannot financially assume; and (4) situations where private ownership is often not possible simply because property taxes are too high to permit sustained ownership of low value land. Thus, even if such land were transferred free into private ownership, thus avoiding consideration of initial investments and interest charges, the income obtainable from its use would likely be insufficient to insure continued successful private ownership. This land would then revert to State or county governments from inability to pay taxes. Its alienation would preclude for all time the possibility, except by purchase, of again getting the land into Federal administration.

V. WEBSTER JOHNSON

Bureau of Agricultural Economics

PRICE—INCOME EFFECTS OF A FOOD ALLOTMENT PROGRAM*

THIS note follows as a logical sequel to the paper "Farm Price Gyrations—an Aggregative Hypothesis" which appeared in this JOURNAL, May 1947. The present analysis is of an immanent nature; we accept the basic concepts of the earlier article and develop them further here through the vehicle of the Food Allotment Program. That program provides us with a purchasing power stimulus, and it is our purpose to trace out the effect of that stimulus on farm prices and income. We employ the Food Allotment Program as a stimulus for two principal reasons: (1) analytically it is a convenient device for dealing with an initial injection of purchasing power directed against food; it provides something approaching the controlled conditions necessary to careful analysis,

* The views expressed here are those of the authors alone and do not necessarily represent the official views of the Food and Agriculture Organization of the United Nations or of the Bureau of Agricultural Economics of the United States Department of Agriculture.

and (2) it seems important to have an informed opinion regarding the economic consequences of what could be a major part of the national farm program, i.e. the Food Allotment Program.

We are not concerned here with the essential rightness or wrongness of the program. Neither are we concerned here with the nutritional aspects of the program, since considerable literature has already been forthcoming on that aspect. Finally, we will not be concerned with the administrative feasibility of the program, for the authors are convinced that any program can be administered successfully provided enough people want the program. Thus, our field of inquiry is narrowed down to the price and income effects of interposing a Food Allotment Program in the distributive system between the farmer and the consumer.[1]

But before we can observe the consequences, on paper at least, of a Food Allotment Progran, we must know something of the nature of the economic situation in which the program will be operating. The consequences of an economic action cannot take place in a vacuum. Therefore, we must postulate an economic situation and drop our program into it. The possible situation we have in mind is a moderate business depression in 1948. This is not a forecast in terms of probability; it is a working assumption in terms of possibilities.

The economic dimensions of such a moderate depression might run as follows: Gross National Product, 170 billion; Income Payments to Individuals, 135 billion; Disposable Income, 120 billion; Consumer Price Level, 135; Prices Received by Farmers, 170; and Unemployment up to 8 million. Further, this is conceived to be a stable situation, one in which the same general pattern is carried along through all four quarters of the year. In other words, the total economy is neither expanding nor contracting through that year, but is, in Keynesian terminology, in equilibrium with 8 million unemployed.

We are now tooled up for the analysis that follows: we have a stimulus in the form of a purchasing power injection, we have a vehicle in the form of the Food Allotment Program, and we have a bench mark in the postulated 1948 situation. The question to be answered now is—What will be the effects on prices received by

[1] It may be worthwhile for those who are unfamiliar with the program and those wishing to refresh their memories regarding the mechanics of the program to read the article by Rainer Schickele entitled "The National Food Allotment Program," this JOURNAL, May 1946.

farmers and farm income from placing in operation a Food Allotment Program of a given size, say $1 billion?[2] When we say $1 billion we mean net or additional food expenditures of $1 billion. To effect additional food expenditures of $1 billion the total cost of the program may total say $1.2 billion, depending on the nature and magnitudes of the leakages and administrative costs involved.

The demand and output functions isolated in the article "Farm Price Gyrations" become the principal operational instruments of this analysis. But these empirically derived functions unfortunately do not have common axes; the variables employed in the derivation of the two functional relationships differ. Therefore, the problem of combining these two functions in an operational system is the problem of formulating common axes.

Identifying the index of per capita consumption on the X axis of the demand function with the index of aggregate food output on the X axis of the output function does not prove too troublesome. The demand function given to this analysis represents, for any given period of time, the relationship between (1) the ratio of retail food prices to nonfood prices and (2) the average domestic consumption of food per person with the effects of income and time removed. That the function is timeless or simultaneous is of extreme importance to the analysis that follows.

The conversion of this *average* domestic demand function to a *total* domestic demand function is relatively simple. It involves simply the multiplication of average food consumption at the various levels of the price ratio, by a population constant.

Our next problem is to identify total food consumption (domestic and foreign) with total food output in order that we may superimpose the total food demand function on the total food output function. To effect this identity we must add to total domestic food consumption the volume of food for exports and for the armed forces and then adjust for changes in food stocks. Assuming that changes in food stocks in the period under consideration are so small as to be negligible, we neglect the latter adjustment. As to the addition of food for export and the armed services to total domestic consumption, this is accomplished at each indicated level of con-

[2] A situation with 8 million unemployed as postulated above would easily absorb additional food expenditures of $1 billion employed in raising the consumption of all persons in the U. S. to the basic food allotment. Every estimate of the food costs of a Food Allotment Program (published or unpublished) that the authors have seen for a depressed situation such as we have described runs considerably in excess of $1 billion and often closer to $2 billion.

sumption by assuming the quantities of food demanded for export has a negligible effect on the slope of the domestic total demand function for food.

With the aid of some rather heroic assumptions then, we have succeeded in identifying total food consumption (domestic, foreign and military) with total food output. Having done this, we now must find a relationship between (1) the ratio of retail food prices to nonfood prices and (2) prices received by farmers for food. When this is achieved, we can superimpose the total demand function on the total output function. Unfortunately the relationship which we seek is not too well defined for all years for which data are available. In recent years, however, under conditions which closely approximate those for the period considered in the analysis, a rather well defined relationship does exist. Using historical data for the recent high level years 1940, 1941, 1942, and 1943, then skipping the years of effective wartime controls 1944 and 1945, and finally using the last half of 1946, we obtain a good straight line relationship between the index of prices received for food and the ratio of food prices to nonfood prices—a relationship which permits us to move back and forth between the two variables (1) ratio of food costs to nonfood costs, and (2) prices received for food.

Corresponding points for these two variables are indicated on figure 1 where the ratio of food to nonfood costs is shown on the left-hand axis (Y) and the index of prices received on the right-hand axis (Y_1). For example, reading off the straight line relationship of the ratio of food prices to nonfood prices to prices received for food, a price ratio of 100 corresponds to 113 on the prices received index. It is on this basic relationship that much of the following analysis is constructed, and the authors recognize that informed judgments will vary regarding the correctness of that relationship.

Before fixing the position of the historical output function EE for the period 1943–46 of figure 2, taken again from the article "Farm Price Gyrations," the decision was made to reduce the slope of that curve to perfect inelasticity. Since the vertical axis of this function or the demand function had to be changed in line with the common axis argument, it was found convenient to reduce the slope of the output function to perfect inelasticity. For that condition would permit the use of any scale on its Y axis. And there would appear to be adequate justification for reducing the slope of the output function EE to perfect inelasticity. First, growing conditions

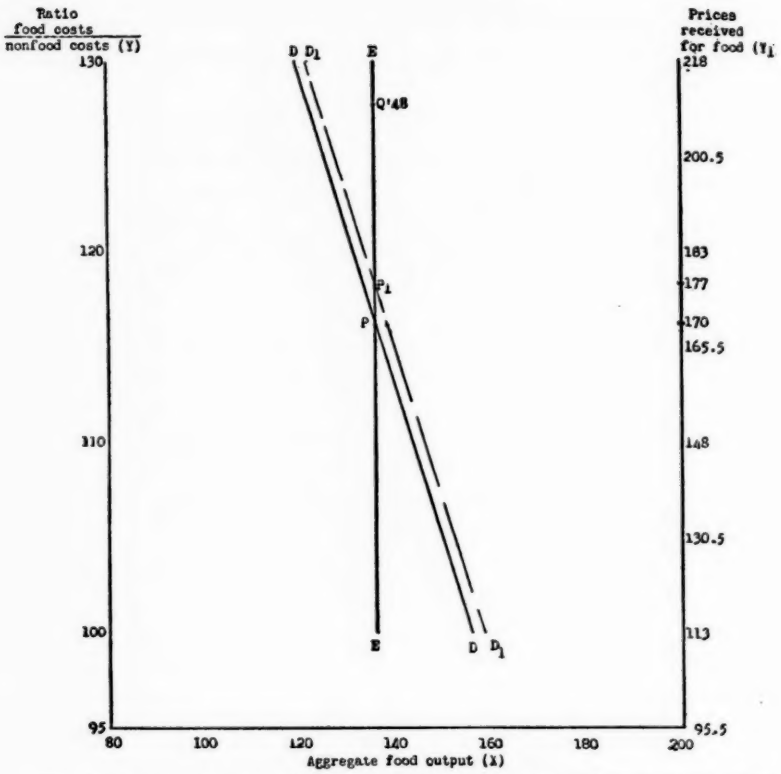

FIG. 1.—Aggregate output in 1948 (point Q'48 falling along the output curve *EE* at 210 on the prices received index—the responsible price in this case) moves into consumption at price 170 indicated by point *P*. With the introduction of the Food Allotment Program (food expenditure of $1 billion) the demand curve *DD* shifts to D_1D_1 and 1948 output sells at a price 177 or P_1.

in the year 1943 were below average and the consequent reduction of total food output influenced the fitting of the curve *EE* with a slight positive slope, whereas had growing condidions been average in 1943 total food output would have been greater and the slope of the curve non-existent. Second, the historical output functions *BB* and *CC*, from figure 2 "Farm Price Gyrations," are perfectly inelastic indicating that a perfectly inelastic output function is not atypical but rather the norm. In figure 1 of this article, therefore, the output function *EE* is presented in a perfectly inelastic form and placed at the point 136 on the index of total food output. Thus we have the position and the slope of the output curve determined for purposes of this analysis.

The slope of the average demand function is unaffected by its

conversion to a total demand function. Therefore the vertical axis, as shown in figure 1, is identical with that shown in figure 3 of "Farm Price Gyrations." The problem is then to give the demand function an internally consistent position with respect to the output function. As previously stated, it is assumed here that (1) all food produced in one year is consumed in that year—that stocks are neither accumulating or being used up, and (2) that the volume of food shipped out of the country as exports has no effect on the slope of the total demand function.

Bearing in mind the nature of the adjustments made in converting the average domestic demand function to a total demand function, we are now in a position to complete our analytical framework. From relationships outside our operational system, it is estimated that the index of prices received for food in 1948 with a disposable income of $120 billion would approximate 170 (1935–39=100). A point of intersection of the demand and output functions is thus provided. Output was estimated at 136 percent of the 1935–39 level; the farm price index at this level of output was estimated at 170; and since we have assumed that all food produced in 1948 is consumed, we superimpose the total consumption function on the output function so that it passes through the point ($X=136$, $Y_1=170$). The demand function, therefore, is now related to the output function in an operational system and we are ready to shift the demand function in response to an increase in food expenditures made through the Food Allotment Program.

The mechanics of shifting the total demand curve in response to an additional $1 billion spent on food through a Food Allotment Program may be described as follows. First, it is estimated from past relationships that food expenditures will amount to about 20 percent of total disposable income in 1947. This conclusion follows from the assumption that additional food expenditures made through a Food Allotment Program behave normally *once introduced into the income stream.* In other words, no peculiar income effects result from the food allotment type of expenditure. This may appear unreal, but the authors could not discover any logical reason for not using past relationships when directly confronted with the problem. Second, in setting up the multiple regression analysis for the purpose of removing the income effects on total demand for food in the article "Farm Price Gyrations" the factor "disposable income" was considered. The problem therefore re-

solves itself into one of translating $1 billion of food expenditures into total disposable income, so that the effects of that expenditure may be reflected in an increase in the index of average civilian food consumption, the independent variable in the multiple analysis. Using the 20 percent leverage factor, the equivalent increase in disposable income is $5 billion. Since the regression coefficient of the income variable was found to be .221 in the multiple analysis, this increase of $5 billion in disposable income effects a 1.1 rise in the index of average civilian consumption ($5 billion $\times .221 = 1.1$).

Having measured the effect of a $1 billion food expenditure program on average civilian consumption, we must then concern ourselves with translating this effect into the total demand function which forms a part of our operational system.

It will be recalled that, in fixing the position of the demand function, we went outside the operational system to estimate the level of farm food prices at 170. Next we superimposed the total demand function on the fixed output function, effecting an intersection at point P (see figure 1). Reading off the left-hand axis of figure 1, we find that the total demand function at the point of intersection yields a retail price ratio of 117. Now, using again the multiple regression analysis, which was employed to determine the net effects of a $5 billion increase in disposable income on average civilian food consumption, we find that with a price ratio equal to 117, disposable income equal to $120 billion, and population estimated at 109.8 per cent of the 1935–39 average, average civilian consumption approximates 111.1 percent of the 1935–39 average. Thus an average civilian consumption of 111.1 corresponds to a total food consumption of 136.

But an average domestic consumption equal to 111.1 percent of the 1935–39 average, with population estimated at 109.8 percent of the 1935–39 average, is equivalent to a *total domestic civilian consumption* of 122 percent of the 1935–39 average (111.1×109.8). The difference then between total consumption (domestic, military and exports) and total domestic civilian consumption at the point of intersection is 14 points (136–122).

We have already estimated that an increase of $5 billion in disposable income would effect an increase in average domestic consumption of 1.1 points on the index (from 111.1 to 112.2). Now since the population is assumed to remain constant, total civilian domestic consumption as affected by the increase in income becomes 123.2 percent of the 1935–39 average ($112.2 \times 109.8 = 123.2$). Add-

ing to this figure the 14 points which represents military consumption and exports, we then have an index of *total consumption* (domestic, military and foreign) equal to 137.2.

The net effect of the $1 billion spent on food through a Food Allotment Program, therefore, is a shift in the demand function 1.2 points to the right for any given price. The intersection of the shifted demand curve D_1D_1 with the fixed output curve *EE* thus determines the price effects of a given expenditure through the Food Allotment Program in terms of the conventional prices received index. Specifically, the shift in demand in this case forces the prices received by farmers for food to move upward on the index from 170 to 177—or an upward movement of 7 points. Stated differently, aggregate food output in 1948 (Q'48 on figure 1) would move into consumption at a price level of 177 instead of 170 by reasons of the defined expansion in demand through the Food Allotment Program.

In the argument just presented it is assumed that stock holdings, principally feed and food grains, are held constant. But should 1947 be another large relief feeding year, so that stocks in the United States remain at a bare minimum, it is entirely possible that dealers in 1948 will make some attempt to enlarge their stocks of nonperishable foods. In that event the indicated upward movement of 7 points on the prices received index would be clearly too little. The building up of food stocks in 1948 would in effect shift the demand curve further to the right than that indicated in figure 1 and prices would go up accordingly. But since we do not know what may take place with respect to stocks, we hold this highly unstable variable constant and observe the expenditures effects on price alone. We recognize, however, that whatever happens to the net stock position in 1948 will seriously affect the index of prices received.

An increase in prices received for food from 170 to 177 in response to a $1 billion expenditure through the Food Allotment Program may seem unduly small. But, when we test this price response against historical experience, it does not appear to be out of line. In those periods in which output held fairly constant and the index of average per capita consumption moved up or down by something approaching 1 point, which represented a sizeable shift until the war years, the response on the prices received index tended to vary from 5 to 8 points. On the basis of past experience we conclude that an upward movement in prices received for food of 7 points associated with a 1.1 increase on the index of per capita food consumption

is entirely reasonable, under ordinary conditions.

In our postulated situation we have held output constant;[3] consequently the whole force of the expanded demand for food has been directed into an upward movement of prices. The individuals participating in the Food Allotment Program have simply come into the market with an expanded effective demand for food, and have bid supplies away from nonparticipating families. And in bidding supplies away from nonparticipating families, the price of food in the aggregate has increased.

What does this rise in the prices received index for food mean in terms of farm income? In terms of cash receipts this price rise may be translated into an additional $610 million to producers. This is estimated as follows. We have already determined that the shift in the demand curve resulted in an approximate increase of 7 points in the index of prices received by farmers for food. Moreover, output was held constant at 136 percent of the 1935–39 level. Since the index of prices received is also on a 1935–39 base, an increase in 7 points implies an increase of approximately 10 percent (7×136) in cash receipts over average receipts in the period 1935–39. Average receipts from food marketings amounted to $6.1 billion in the period 1935–39, consequently 10 percent of this figure gives us $610 million. *And since farm producers have experienced no additional costs*—output is held constant—it logically follows that these additional cash receipts of some $600 million represent additions to *net farm income.*

The price, quantity, and income effects of $1 billion expended on food through a Food Allotment Program under the assumed conditions may be restated as follows: (1) the quantity effect is zero since the position of the output function has consciously been held constant, (2) the price effect amounts to a movement of 7 points on the index of prices received or in our case an upward movement from 170 to 177, and (3) farmers receive in addition to their normal receipts some $600 million as net income.

WILLARD W. COCHRANE
ROBERT H. MASUCCI

Food and Agricultural Organization
Bureau of Agricultural Economics

[3] A full treatment of this problem calls for an analysis of the movement of the output function. For the output function is not, on the basis of historical experience or the logic presented in the paper "Farm Price Gyrations," likely to remain positionally fixed over the next few years. The authors, however, lacked the time to develop such a full treatment. This note concentrates simply on the combining of the output and demand functions in an operational system.

HAYMAKING JOB ANALYSIS

A DETAILED study of hay harvesting methods was made on 30 Michigan farms during the summer of 1946. The purpose of this study was to determine (1) the amount of man labor required for haymaking on farms using different types of equipment, (2) the factors causing variation in the amount of labor required on farms using the same type of equipment, (3) the rates of performance and other factors affecting the choice of haymaking methods and equipment, and (4) the ways of reducing the time, energy, or both required for hay harvesting.

The most time-consuming part of the haymaking job was the the moving of the hay from the windrow to the mow. Therefore the emphasis of the study was placed on this part of the haying work. The farms studied were classified by the type of equipment used to handle the hay in the field. In Michigan there are five major types of equipment used: hay loader, buck rake, field chopper, one-man baler, and three-man baler.

Selection and evaluation of the sample

The procedure of selecting the farms to be studied followed a course of convenience rather than a statistical sampling procedure. County agricultural agents in Central Michigan were asked to send a list of farmers in their counties who were using the different types of equipment. These farmers were contacted and a schedule set up to visit as many farms as possible on the dates the farmers planned to do their haying work.

The method of obtaining the sample may have led to some bias in the results as the county agents were possibly better acquainted with the more experienced operators of the various machines. No adequate means of evaluating the sample is available, but it is felt that the data represents a group somewhat above the average of all farms. However, since the same factors affected the selection of all the farms in the sample, the comparisons between groups of farms in the sample should be reasonably accurate.

Probably of greater importance in determining the reliability of the results is the number of farms included in the study. With only one worker it was impossible to obtain more records during the haying season. The averages should be viewed as an indication of the relationships rather than proof.

Collection of data

The research worker spent approximately one half a day on each farm during the time hay was being hauled. In each farm the following information was recorded:

1. General information on the conditions affecting the haying work.
   (a) Description of field; size, shape, topography, and distance from barn.
   (b) Kind of hay, when cut, when raked, size of windrow, and raking pattern.
   (c) Kind and type of power and equipment used.
   (d) Type and weight of hauling vehicles.
   (e) Haying crew and principal job of each member.
2. Detailed record of the haymaking operations. The operations were divided into the following elements:
   (a) Travel from barn to field entrance.
   (b) Travel in field.
   (c) Preparation for loading.
   (d) Loading.
   (e) Unhooking and preparing to travel.
   (f) Travel out of field.
   (g) Travel from field entrance to barn.
   (h) Unloading and storing.

These elements were timed with a stop watch for each load observed on the farms included in the study. In addition to the time record, the number of men involved in each element was noted as well as the distance the equipment and crew traveled. Each load was weighed on a pair of portable scales. The observer also noted and recorded as much information as possible on the way the work was done on each farm.

Analysis of data

Prior to the analysis of the field data, the various pieces of equipment were evaluated on the basis of their labor saving possibilities. The major operations in the job of haymaking were listed and each machine was considered in terms of the operations for which the machine reduced or eliminated man labor. The list of operations considered and the results of the analysis give an indication of the labor saving possibilities of the equipment. The operations considered were:

1. Bunching
2. Elevating to hauling vehicle
3. Loading

4. Transporting to barn
5. Unloading
6. Transporting to mow
7. Storing in mow

The hay loader eliminates the need for bunching hay and substitutes mechanical for man power in elevating the hay to the hauling vehicle. It does not affect greatly the hauling or the handling of the hay at the barn.

The buck rake eliminates the need for bunching and enables the operator to load and elevate the hay without hand labor. The buck-rake changes the method of transporting the hay to the barn and the unloading at the barn, but does not affect the work of storing in the mow.

The field chopper eliminates the need for bunching, and the hay is elevated and loaded entirely by mechanical means. At the barn the blower, which is a part of the equipment combination, elevates the hay to the mow and distributes it in the mow. The chopped hay adds to the problem of unloading at the barn. Some farmers have practically eliminated hand labor in unloading, but this should be considered as a credit to the farmer and not to the use of the field chopping equipment.

The pick-up or field baler, when used only for baling, is chiefly a mechanical means of bunching hay, a job that was eliminated by the other pieces of equipment. When the baler is equipped with a slide for loading on a towed wagon, the machine performs the elevating to the hauling vehicle. The fact that the hay is baled affects the methods of loading, unloading, and storing but it does not reduce the need for man labor to perform these operations.

This discussion of the possibilities for labor saving indicates that the field chopper and blower combination offers a means of performing more of the operations mechanically then any other type of equipment. The buck rake performs more mechanical handling of loose hay than the hay loader. The baler provides a compact and uniform bunch of hay to handle but does not eliminate much of the hand work of haying.

The analysis of the records obtained on the farms supports this theoretical analysis to a considerable degree. The hours of man labor required to move a ton of hay can be used to indicate the effectiveness of the equipment in reducing the labor on the actual farms. The average figures show that the farmers using buck rakes and

field choppers required the fewest hours of labor to move one ton of hay from the windrow to the mow. (Table I). The farmers using hay loaders and one-man balers required more hours, and the farmers using three-man balers were using the greatest amount of labor per ton of hay.

The average figures give an indication of the relationships between the groups of farms. However, the range evidenced within the groups may be of greater significance than the comparison of the group averages. There was greater variation among farmers

TABLE I. LABOR REQUIRED TO MOVE A TON OF HAY FROM WINDROW TO MOW IN CENTRAL MICHIGAN BY TYPE OF EQUIPMENT USED, 1946*

	Loose Hay		Chopped Hay	Baled Hay	
	Loader	Buck Rake	Field Chopper	1-Man Baler	3-Man Baler
	(Hours)	(Hours)	(Hours)	(Hours)	(Hours)
Low Farm	1.5	.6	.6	1.2	2.0
High Farm	2.5	3.4	1.9	2.5	2.8
Average	1.9	1.4	1.4	2.0	2.2

* For a true comparison the hauling time was adjusted to the average hauling distance of approximately 100 rods on all farms.

using the same type of equipment than between groups using different types of equipment.

The comparison of the effectiveness of the different types of equipment in terms of the rate of accomplishment gives another picture of the haying problem that should be considered. Some farmers are perhaps more interested in the amount of hay that can be handled in a given length of time than in the hours of labor required per ton of hay. This basis of comparison gives a somewhat different picture of the rank of the types of equipment. (Table II).

In general the larger pieces of equipment seem to have an advantage when compared on the basis of the average tons of hay that can be handled in an hour's time with the equipment and crew. However, the same wide variation is shown within the groups as was shown in the table giving the hours required per ton. This means that the possession of a given piece of machinery does not necessarily mean that the farmer will benefit in terms of labor saved or greater speed in haymaking. The way the equipment is used can make a greater difference than does the type of machine.

The comparison of the records on the basis of the equipment used

leads to the conclusion that no definite recommendations can be made as to the type of haying equipment that is most efficient for all farms. The choice of equipment depends upon the conditions on the individual farm. The conditions that must be considered in fitting the equipment to the needs of the farm include (1) the quantity of hay to be harvested, (2) the distance hay is hauled, (3) the available family and hired labor, (4) the alternate uses of the equipment, (5) the amount and location of the storage space, and (6) the size, shape, and topography of the fields.

TABLE II. TONS OF HAY MOVED FROM WINDROW TO MOW IN ONE HOUR IN CENTRAL MICHIGAN BY TYPE OF EQUIPMENT USED, 1946*

	Loose Hay		Chopped Hay	Baled Hay	
	Loader	Buck Rake	Field Chopper	1-Man Baler	3-Man Baler
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
Low Farm	.8	.6	1.0	1.5	1.8
High Farm	2.3	4.1	6.2	2.5	3.0
Average	1.5	1.8	2.5	2.1	2.2

* For a true comparison the hauling time was adjusted to the average hauling distance of approximately 100 rods on all farms.

The study of the problems of haymaking leads further than the comparison of group averages. The farm records must be analyzed further to find the differences and the reasons for the differences among the farms in the same group. A comparison of the time required to perform each element in the haying operation indicates that there is also great variation in the time taken for each element. The data for any of the groups would illustrate this variation but only the data for the farms using hay loaders will be shown here, (Table III).

Study of the various elements that make up the haying operation points out that the two operations where the greatest improvement is possible are in loading and unloading. There is great variation in the other elements, but the time for one element such as preparing to load could be cut in half without greatly affecting the total time to move a ton of hay. Nevertheless, these elements should not be overlooked. There are four elements that involve travel and, on the farms using hay loaders, the average travel time made up 20 percent of the total time.

The analysis of the records within the various groups indicates

that the major factor affecting the efficiency of labor and the rate of accomplishment was the amount of hay carried in a load. Many farmers have adopted greater power and new equipment resources but have not changed their work habits to effectively utilize these new factors. The tractor is capable of hauling larger loads than a team of horses, but only a few farmers have changed their hauling vehicle or size of load to take advantage of this extra power in their haying work. Perhaps a part of the failure to use new equipment fully is due to inadequate information as to the capacities and proper methods of operation of the new equipment.

TABLE III. LABOR REQUIRED TO MOVE A TON OF HAY FROM WINDROW TO MOW ON SEVEN CENTRAL MICHIGAN FARMS USING HAY LOADERS, 1946

Elements of the Haying Operation	Average	Range	
		Low	High
	(Minutes)	(Minutes)	(Minutes)
Travel—barn to field entrance*	7.7	3.5	15.3
Travel in field	2.6	.8	3.7
Preparing to load	2.4	1.4	3.9
Loading	43.2	20.5	61.5
Unhooking and preparing to travel	1.8	.4	2.8
Travel out of field	3.4	2.5	4.6
Travel to barn*	9.4	5.3	14.5
Unloading and storing	44.2	30.3	63.0

* Distance adjusted to 100 rods on all farms.

The majority of the other factors causing differences among the individual farms falls into the category of organization and planning of the work. Here the capability of the individual farmer is evidenced. Although there are many things involved that can not be recorded or measured, some indication of the nature can be obtained. Planning the raking and loading so that a load can be completed near the field entrance makes some difference in the travel time. Maintaining the equipment in proper repair and adjustment affects the rate of operation as well as the loss of time from delays caused by breakdown and improper functioning. Organizing the work to take full advantage of the equpiment and crew available is a major problem especially with the larger and more expensive pieces of equipment. A smooth working organization that keeps the men and equipment operating at a steady pace without idle time is an evidence of skill in the coordination of men and ma-

chines. A problem that faces many farmers is the choice of unloading method to fit the conditions found in the barn on the particular farm. As almost every farm presents a different problem, the ability of the operator in adapting the best method to the conditions may be considered as mechanical or as managerial ability.

Summary and Conclusions

The study of hay harvesting has pointed out several things that indicate the value and the problems of using the techniques of job analysis on the field work operations. These techniques point out the importance of the managerial ability of the individual perhaps even more than do other methods of farm management research. Moreover, job analysis appears to have greater possibilities in pointing out the factors that are associated with managerial ability and outlining methods in such a way that they can be shown and taught to others.

The results of the study of haymaking may be summarized as follows:

1. No one method is best for all farms.
2. There is greater variation among farmers using the same type of equipment than between groups using different equipment.
3. The choice of equipment should depend to a considerable extent on the conditions on the farm.
4. Farmers do not have adequate information on the proper operation of the newer types of equipment.
5. The managerial ability of the operator may have greater effect on the success or failure with a given machine than the capabilities of the machine.
6. Each farm presents a different problem, and the best method of improving the haying operations on a particular farm may be to study and improve the methods of using the present equipment.

B. R. BOOKHOUT

Michigan State College

COMMENTS ON "THE COST OF SUBSISTENCE" BY GEORGE J. STIGLER*

THE author of "The Cost of Subsistence" has planned a really minimum-cost diet[1]—the "minimum cost of obtaining the amounts of calories, proteins, minerals, and vitamins" necessary

* A note published, this JOURNAL, May 1945.

for adequate human nutrition. The cost of this diet is far below that of the usually planned minimum-cost adequate diet. However, the author has neglected to consider certain important physiological, chemical, dietetic, geographical, seasonal, and cultural factors.

Nutritionists, in publishing minimum-cost diets for low-income families, often do not explain the basis on which such diets are planned. These principles are generally understood by dietitians, social workers, public health workers, and others who guide families in following these planned diets. Because of this fact the critical lay reader may feel that the nutritionist has been unnecessarily extravagant in her planning.

In planning nutritionally adequate diets at minimum cost a number of factors need to be considered in addition to obtaining the necessary amounts of the ten known nutrients for which we have tentative standard daily allowances. A nutritionally adequate diet—even a subsistence diet—calls for more than merely the necessary amounts of calories and protein and those few of the essential minerals and vitamins of which we know the approximate daily requirements. Some of these other factors considered in planning nutritionally adequate diets at minimum cost are listed and briefly explained below.

Physiological factors—In order to be really adequate a diet must not only contain a sufficient amount of all the necessary nutrients, but it must also be edible and digestible. Palatability is a matter of opinion and varies with cultures and customs, but the human digestive tract (over which one has but little control) has definite functional limitations. After living on an omnivorous diet for ages, man has become biologically adapted to this type of diet. A diet too restricted as to variety and too high in one or two foods may soon become nutritionally inadequate through psychological reactions of

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[1] Food allowances per person per year, as given by Dr. Stigler, for August, 1939, are as follows:

Commodity	*Quantity*	*Cost*
Wheat flour	370 lb.	$13.33
Evaporated milk	57 cans	3.84
Cabbage	111 lb.	4.11
Spinach	23 lb.	1.85
Dried navy beans	285 lb.	16.80
		$39.93

The present comments are based on this diet only, but would apply also, with few exceptions, to Dr. Stigler's diet as planned for August, 1944.

the consumer or through resulting digestive difficulties. Some foods may be tolerated and be nutritious if consumed in small amounts but may be toxic or otherwise harmful if consumed in large quantities day after day. Dry beans, at least for many individuals, would fall in this category. If a diet is culturally unacceptable, unpalatable, inedible, physiologically irritating, or too bulky it cannot (or will not) all be eaten. As a result, not only the intake of calories but of other nutrients as well will be below the desired level.

Of the three sources of energy in food, starch and protein yield only four calories per gram, whereas fat, a much more concentrated and less bulky source of energy, yields nine calories per gram. The diet planned by the author of this article contains only fifteen grams of fat per day, which supplies only four and one-half percent of the day's energy needs. This makes it necessary to eat a large amount of starch in order to supply the remaining ninety-five percent of the day's calorie requirements—an amount which may be beyond the capacity of many even so-called normal digestive tracts. In general, the diets of people in the United States contain about fifty to one hundred grams of fat per day, which furnishes fifteen to thirty percent of man's energy needs.

Over ninety percent of the vitamin A in this diet is supplied by leafy vegetables, namely, cabbage and spinach. It is known that the pro-vitamin A (carotenes and other plant pigments, which are transformed into vitamin A in the body) in green leafy vegetables is not completely utilized and transformed into the vitamin by the body—in fact, the utilization averages about fifty percent. In a diet that is barely adequate in total vitamin A value, and in which less than ten percent of this vitamin is of animal origin (from milk, butter, eggs, liver, fish liver oil—foods rich in true vitamin A, the readily utilized form), the total available vitamin A in the diet would be inadequate to meet the body's needs.

Chemical factors—In addition to meeting the standard daily allowance of eighty grams of protein per day it is generally conceded that a diet, in order to be adequate, must contain some animal protein, unless the protein in the diet comes from sufficiently varied plant sources to assure an adequate intake of all the essential amino acids. In Dr. Stigler's proposed diet only six percent of the body's protein needs are met by protein of animal origin. Since the plant foods in the diet are quite restricted as to variety, there may well be some doubt as to the biological adequacy of the protein in the

diet, even though the total protein is almost double the standard allowance.

Twelve or more minerals and at least this number of vitamins are known to be essential for good human nutrition. In planning diets to meet the estimated needs of the body for the eight minerals and vitamins for which standard daily allowances are listed by the National Research Council, foods are selected from a variety of sources, in the belief that this is the best way in which to meet the needs of the body for the additional sixteen or more minerals and vitamins for which we do not have "standard allowances." It may be questioned whether Dr. Stigler's proposed diet, with its very limited number of food items, would meet the body's needs for these other nutrients.

Whole wheat is rich in the numerous (eight or more) fractions of the vitamin B complex, and in vitamin E, whereas fifty to ninety percent of each one of these vitamins is lost in the manufacture of white flour. In a low-cost diet, which is inevitably high in wheat flour and other cereal products and low in the "protective foods" (fruits, vegetables, milk, eggs, and meat), it is important that half or more of the cereal products be whole grain, in order that the body's needs for these vitamins be met. In the proposed diet wheat flour supplies fifty-four percent of the calories and all the flour is the highly milled (white) form, as indicated by the cost. On calculating the nutritive value of this diet it was found to be thirty-seven percent low in riboflavin and seventeen percent low in niacin. It is very likely that some of the other members of the B complex are present in inadequate amounts. In calculating the nutritive value of the diet composition data for unenriched white flour were used. Even enriched white flour would probably leave the diet deficient in the B vitamins other than thiamine, riboflavin, and niacin, the three vitamins added to white flour when it is enriched Cooking would make the diet still more inadequate, but most of these foods could not be consumed or digested in the raw state.

Dietetic factors—In order to make the large amount of flour in the diet edible and digestible some leavening agent would be needed. Soda and baking powder, being alkaline, are known to destroy twenty percent or more of the thiamine in flour when used in baking quick breads. Yeast does not have this objectionable feature; however, its frequent use would add several dollars a year to the cost of the diet.

In planning diets (even minimum cost diets) a small margin of safety is allowed to cover a slight and inevitable loss in storing, preparing, and serving food. Five or ten percent is usually added to the minimum amount required to take care of this loss. No such allowance has been made in this case.

In cooking foods, such factors as cost of fuel, cooking equipment, and time must be considered. In this case the cost of fuel needed in cooking would add considerably to the total cost of the diet.

In cooking food there is always some loss of vitamins, especially of ascorbic acid and thiamine. Approximately ten percent of thiamine is lost in baking bread; there may be as much as a fifty percent loss in thiamine in preparation of foods that need long cooking, such as dried beans. These estimated losses in cooking would make this diet about twenty-five percent below the standard allowance for thiamine. Ascorbic acid is even more readily lost in cooking and during storage. In order that this diet be adequate in ascorbic acid, all of the cabbage and the spinach would have to be freshly harvested and consumed raw, which, of course, would be impossible.

Geographical and seasonal factors—In planning nutritionally adequate diets at minimum cost, geographical location and seasons must be considered. Fresh cabbage and spinach could not be obtained at low cost throughout the year, except possibly in the extreme southern part of the United States. In the northern part of the country two-thirds to three-fourths of the year's supply of spinach and cabbage in this diet would be canned, winter stored or krauted and would be very low in ascorbic acid content. The total year's supply of these vegetables could hardly be consumed in the fresh state during the relatively short period of the year when they could be obtained at low cost in this form. Even though this were possible, it would not meet the individual's year-round needs for ascorbic acid, since this vitamin is not stored to any great extent in the body, and any intake beyond immediate physiological needs is largely excreted within a few days.

Availability of markets and possible price fluctuations in some areas would also need to be considered.

Cultural factors—National, racial, religious, and other cultural factors need to be taken into consideration in planning a nutritionally adequate minimum-cost diet for any group of people. Recent family history, economic level, and food habits need to be considered. The purpose in planning minimum-cost diets is not only

to determine the lowest cost for which the required amounts of ten given nutrients can be supplied to people, but to plan a diet which will actually meet the total nutritive needs of a given group. There are no doubt millions of people in Europe and in the Orient who would benefit nutritionally if they could secure Dr. Stigler's diet. It is much higher in nutritive value than many emergency famine diets. However, an "emergency" diet is admittedly not a nutritionally adequate diet and is intended only for use during short emergency periods. A "nutritionally adequate" diet is one that can be consumed for indefinite periods without resulting in discomfort or malnutrition.

In order to make Dr. Stigler's diet adequate from every standpoint at least the following changes would need to be made: Have half the flour whole grain, increase the amount of milk (especially in families with children), include a greater variety and greater total amount of vegetables, include some tomatoes and other fruits, reduce the quantity of navy beans, include some low-cost cuts of meat, add fortified oleomargarine, increase the total food allowance about five percent to cover inevitable waste, and add a small sum to the total cost to provide for such items as beverages, condiments, sweets, which help to make a restricted, though nutritionally adequate, diet tolerable.

MARTHA POTGIETER

University of Connecticut

REVIEWS

The Wallaces of Iowa, Russell Lord, Boston: Houghton Mifflin Company, 1947. Pp. 615.

The readers of this journal no doubt have already read reviews enough of this book as a document on the Wallaces. The comments which follow will mainly be upon it as a document on American agricultural policy and its evolution. As such, it will have to be adjudged like that of any other contemporary participant or observer. The compiliers of such documents need not limit their memoirs and memoranda to the parts of the record which they know most about from personal experience, but commonly they largely do. In this respect, *The Wallaces of Iowa* is much better than the ordinary memoirs because Russell Lord took the trouble to consult a number of other memoirs, like those of the first Henry Wallace, of George Peek, and of Henry C. Taylor (unpublished), and in some measure to have his account checked over by participants in the action. As an historical document, however, it would be much more useful if the author could have done more of this. Doing nothing more than to exploit the contemporary studies made by the Brookings Institution, summarized in *Three Years of the AAA*, by E. G. Nourse, J. S. Davis, and J. D. Black, would have helped considerably. Perhaps this point can be clinched simply by stopping to think what else Chester Davis would put in his memoirs for the years when he was associated with Henry Wallace, or Howard Tolley, or J. B. Hutson.

The other attribute of personal memoirs of this sort, namely, that they unavoidably reflect the attitude and interests of the writer, is even more manifest in this document. Russell Lord is clearly no trained historian presenting all of the evidence and letting these reveal his subject. He is presenting to his readers his Henry A. Wallace and "Young Henry's" two forebears. The first attribute of the document which we are reviewing caused some significant parts of the record to be omitted because the author had no contact with them and did not discover them in his source materials. The second attribute caused him to omit even more revealing parts of the record because they did not fit into his conception of his three subjects. Much of the time, this reviewer does know which of the two was the cause of the omission.

Given the foregoing as warning, any one interested in the development of American agricultural policy in the period from 1897 when Uncle Henry Wallace's friend James Wilson became Secretary of Agriculture, until Henry A. Wallace resigned to run for Vice President in 1940, can safely use this book as one of his major sources. For some parts of the story, this book will be his most informative or at least most revealing source. Under this latter head belong his reporting of Henry C. Wallace's thinking on agricultural matters when he came to Washington in 1921, and the steps by which the McNary-Haugen movement developed and the split widened between him and the administration; also the process by which he and his son Henry, then wrestling hard with the causes of the agricultural depression in the pages of *Wallace's Farmer*, came to espouse a program of reducing total agricultural output to bring it in line with declining exports; and of how Henry A. Wallace conceived and developed his idea of the "ever normal granary."

His report of the purging out of the *AAA* in February 1935 of Jerome Frank, Lee Pressman and other Tugwellians puts down in writing for the first time some of the more significant details of it. More real information as to its antecedents would have been highly illuminating. Mention is made of the assignment of Tugwell to represent the United States at the 1934 annual assembly of the International Institute of Agriculture in Rome. It would have been well to have explained how he happened to get this assignment, and Paul Appleby along with him. Even the particular issue which led up to the final incident of the purge—the interpretation of the rule about landlords and the croppers and tenants in the South—needs much clearer statement.

The failure to provide a clear statement in this case illustrates perhaps the major fault in this document: namely, it often presents only in vague, general, and even confused terms some major development in agricultural program and policy. For example, so vague is the treatment of the evolution of the Farm Security Administration that this reviewer is not certain that Russell Lord ever learned the difference between the rehabilitation loan and the tenant purchase programs, and the relation of these to the program of resettlement projects. Again, he makes it clear that the Secretary Wallace came in time to look upon the *AAA* program as one not for getting less total agricultural output, but for getting agricultural production shifted into the right lines—of "balanced abun-

dance" within agriculture; but the details and timing of the transition are largely missing.

The most glaring omissions are the complete failure to deal with the bringing of the Farm Credit Administration into the Department of Agriculture, and the almost complete failure to deal with the unfortunate attempt to make the Bureau of Agricultural Economics the policy-making arm of the Department, and the accompanying system of interbureau coordinating committees, county-planning committees and the like.

Perhaps as befitting a man who is writing about former associates who are still living, Mr. Lord deals gently with the mistakes and deficiencies of those who were associated with the second Secretary Wallace. Someday someone needs to come out boldly and say what was wrong with Peek, Brand, Tugwell, Frank, Pressman, Jackson, and Baldwin that made them clear misfits in the AAA program, while recognizing clearly the definite contributions that Tugwell and some others made to the important FSA developments.

There is some misrepresentation in the book. As good an example of this as any is Secretary David Houston's contribution to developing the economic work of the Department of Agriculture, and the whole Houston-Spillman episode; likewise the role played by Spillman in the Department of Agriculture after he was called back to it in 1921.

There is also confusion and some error in the handling of the part of the program that this reviewer was associated with a little. The "domestic allotment plan" that President Roosevelt presented in his Topeka address in 1932 was based on the Hope-Norbeck bills introduced in the closing months of the preceding Congress. These had been drafted largely by M. L. Wilson, who was lobbying for the domestic allotment program in Congress that spring, with help from Mordecai Ezekiel and this reviewer, both then associated with the Federal Farm Board. Mr. Tugwell learned about these proposals at a policy conference called at the University of Chicago in June. (Wilson was on the program to report upon his progress with Congress.) Tugwell asked Wilson to come to New York and present the plan to Roosevelt and his brain trusters. The domestic allotment plan put in the Hope-Norbeck bills was based on a presentation of it in Chapter X in this reviewer's *Agricultural Reform in the United States*, published in 1929; but contained two important departures. One was the use of processing taxes. This change was

made because Stanley Reed, then Solicitor of the Federal Farm Board, had opined that the domestic allotment plan would be unconstitutional in its then form, and Judge Redpath of the U. S. Chamber of Commerce had, at Henry I. Harriman's request, revamped it to make use of the taxing power. This had been decided upon at a conference called by Harriman in Chicago to consider Wilson's proposal. Harriman had learned of the proposal from Wilson, who was then a member of the Committee on Agriculture of the U. S. Chamber of Commerce.

The proposal outlined in Chapter X of *Agricultural Reform* was not original with the author of that book, but was instead an attempt to present in workable form the ideas of none other than Dr. Beardsly Ruml, who had worked them out as something to take the place of the McNary-Haugen proposals which he did not like. Probably he got his original suggestion from the German import certificate scheme. At least, he always cited this as a precedent. Dr. Ruml did not know at this time about Spillman's *Balancing the Farm Output.* He was at this time director of the Laura Spellman Rockefeller Fund. Dr. Edmund Day, then of the Rockefeller Foundation, assigned Dr. Ruml $5,000 to finance an exploration of his proposals. This reviewer used about two-thirds of this $5,000 in assembling the materials in *Agricultural Reform.* He of course knew of Spillman's Limited Debenture Plan, compared it with the Ruml proposals, and no doubt obtained some suggestions from it. Also, no doubt, did Wilson and Ezekiel when they were working on the drafts of the Hope-Norbeck bills. Dr. Spillman himself considered the Ruml Plan with its "transferable rights" as definitely superior to his Limited Debenture Plan.

One of those working with this reviewer on Ruml's proposals definitely favored the use of processing taxes. Dr. Ruml was strongly opposed to them. He did not want farmers getting checks directly from Uncle Sam. Perhaps it needs to be explained that Dr. Ruml was not seeking any publicity in those years, and would not allow his name to be used in connection with his plan. The reviewer had to present it to Congress in the spring of 1929 as "author unstated."

The other major change in the Hope-Norbeck bills from the Ruml Plan was the incorporation in them of the parity price or equality-of-exchange idea of the McNary-Haugen bills. Under the

Ruml Plan the prevailing level of tariff duties would have determined the price premiums.

It later became Stanley Reed's task to defend the AAA act in the Hoosac Mills case. He used some of the same arguments as he had used in commenting on the Ruml Plan of Chapter X. But the majority opinion of the Supreme Court ran in the opposite direction.

Perhaps it may be of some interest that two of the central ideas of the agricultural legislation of 1933 to 1937—domestic allotment and "adjustment"—from which came the middle term of the AAA—were central ideas in *Agricultural Reform*, and of the educational program that M. L. Wilson was so vigorously promoting in the years from 1928 to 1933. Although Lord's book deals adequately with M. L. Wilson on the whole, it does not make emphatic enough his key position in the evolution of the Farm Act of 1933.

The most amusing error in *The Wallaces of Iowa* is the author's taking the decline of 250,000 farms between 1925 and 1930 reported in the census of 1930, as if it had actually happened, instead of being almost wholly a census phenomenon, and the even more census-manipulated increase of 500,000 between 1930 and 1935, and using them as evidence in support of certain Tugwellian hypotheses about American agriculture.

Although this review does not concern itself with Lord's book as a document on the Wallaces, it is fitting to conclude it with a few remarks along this line. The reviewer believes that the author has presented an excellent analysis of Henry C. and Henry A. Wallace and their ideas and motivations. This was the author's major task and he has done this well. The principal deficiencies on this score have to do with Henry A. Wallace as an administrator of the Department of Agriculture. Beyond all question, Henry A. was one of the greatest "leaders" any department of our federal government has ever had. But he was not so good a "governor" of it. And it surely needed governing in his years. Henry A. Wallace was a poor disciplinarian, and as such let things drift and get out of hand, and then under very great pain at the very last moment seized an axe and went to it. Getting Frank and some of his group out of the Department of Agriculture was necessary, but the purge as such could have been avoided by timely action. Perhaps there was a certain dramatic justice in President Roosevelt's resorting to purge

methods when he abolished the Board of Economic Warfare in 1943.

JOHN D. BLACK

Harvard University
Cambridge, Mass.

Prices of Dairy Products And Other Livestock Products, Frank A. Pearson and Edmund E. Vial, Cornell University Press, Ithaca, New York, 1946. Pp. 154.

This book presents a statistical analysis of factors affecting the prices of some dairy and poultry products, meats, and fats. The analysis covers the period 1920–41 and is made mostly at the wholesale level. In addition the book contains a chapter on "Demand and Supply Curves Versus Supply-price and Diversion Curves."

The abbreviated title, "Prices of Dairy Products," leads one to expect a more extensive treatment of dairy prices than is provided. Only about one-third of the book is devoted primarily to dairy products. The analysis is limited largely to the relationship of current production, storage stocks and the general price level to the price of each product, although for some items consumption also comes in for brief discussion.

The analysis of dairy prices is limited to butter, cheddar cheese, evaporated milk, ice cream, dry nonfat milk solids and casein. No analysis is made of fluid milk and cream prices although these two products in cities and villages absorb about 40 percent of the total commercial supply of milk. Exclusion of these two items is explained by stating that "prices for the various classes of milk (in the New York milk shed) are based upon prices of butter, cheese, nonfat dry milk solids (dry skim milk) and prices paid by condenseries for milk." The job of translating these product prices into fluid milk and cream prices is left to the reader. The analysis is extended to prices of poultry products, meats and fats (including cottonseed oil) "to determine whether the relationships were similar to those for dairy products."

The authors make a valiant attempt at making their book both technically accurate and popular. It is well organized and readable. The method of analysis is clearly set forth as are also the various sources of data. It is doubtful if the trade is especially interested in the technical aspects of correlation analysis or in alleged differences among technical workers over the best statistical devices to use and

yet it appears that the book is designed primarily for those engaged in handling dairy products.

The book contains a large amount of data and discussion which are useful to anyone wishing background information on prices of the particular products covered in the study. The reviewer wishes that the authors had penetrated deeper into the factors affecting dairy prices including fluid milk and cream rather than to extend their analysis to other livestock products.

Conclusions such as these: "The price level and supply explained 51 to 87 percent of the variation in monthly prices of butter," and "the price of butter, the supply of cheese and the price level explained 55 to 91 percent of the variation in cheese prices from August to February" obviously leave a considerable part of the price of these particular products still unexplained.

The price level as measured by the index of 30 basic commodities is found to be the most important factor, 37 to 92 percent, in explaining the monthly variations in the price of butter, and the price of butter in turn was the most important factor explaining the price of cheese. However, the price level taken alone appeared to have only a negligible relationship to the price of cheese. For evaporated milk, casein and cheese the price level is in each case weighted twice—once as a direct factor and once as an indirect factor through the price of butter or dry nonfat solids.

Butter consumption is shown to decrease only 0.2 percent for each 1.0 percent increase in the retail price. This would indicate that the demand for butter is much more inelastic than is generally believed. Perhaps some caution should be taken in applying average relationship for the period 1920–41 to present conditions. There have been many changes in quality, quantity and acceptability of several foods. This study is much more useful in showing past price relationships than in providing a basis for predicting future prices.

R. K. FROKER

University of Wisconsin

Drought, Its Causes and Effects. Ivan Ray Tannehill. Princeton, N. Y.: Princeton University Press. 264 pp. $3.00.

As a preface to this valuable discourse on droughts, Mr. Tannehill outlines in some detail the social and econonic impact of droughts, as experienced during the history of this and other countries. He then combines a large number of known meteorological and

climatological relationships with an amazing array of data into a theory of drought which, within the context of available information, accounts for their occurrence in the past and which will undoubtedly be tested with interest in the future.

Mr. Tannehill rejects the "classical" view, that droughts are the result of random combinations of rain deficient days, for the "objective" approach which adds variations in solar radiation (inter alia) as a probable causal element. To the classicals, climate is simply average weather, whereas "the objective view holds that the climate itself changes through the years and attributes climatic changes to variations of solar radiation."

The author sees the oceans, particularly the Pacific, as the media through which persistent controls of the rainfall are maintained in the United States. The Pacific probably exercises an influence second only to that of the sun on the weather of this country. Increasing solar heat accelerates atmospheric circulation; this tends to alter the distribution of ocean temperatures, which affects the location and intensity of the North Pacific high, and shifts the continental inflow of Pacific air.

When pressure east of the Rocky Mountains is relatively high in the north and relatively low in the south, there tends to be more than normal rainfall in the United States. Simultaneously the pressure on the Pacific coast, and presumably over the eastern North Pacific ocean, is relatively low. When the converse situation prevails, rainfall tends to be deficient in this country. Due to prevailing westerly circulation air must cross the Rockies into eastern United States; if pressure status inhibits this inflow to the north it must accumulate and be forced over in the south. When this occurs profound change in the distribution of rainfall is associated and droughts become serious and widespread.

The author feels that a great deal of work is yet to be done on the problem of droughts, but he is optimistic that improvement in prediction is assured as information and analyses accumulate. Control of the climate is not considered outside the realm of possibility, but in that event effective regulatory measures would be needed to avoid "exportation" of undesirable weather.

Sophistication in meterology is not prerequisite to comprehension of this discourse, but some familiarity with this subject facilitates reading. Clarity of expression and excellent illustrative materials compensate largely for a reader's possible unfamiliarity with tech-

nical content. The quality of the theory will be determined by further observation and analysis. The reviewer feels, however, that at least two facets of this problem merit further consideration than accorded them in this book. Attribution of ultimate drought causation to variations of solar activity involves the complex problems of "reaction time" between solar change and climatic response and, in addition, the prediction of solar dynamics as a prerequisite to effective longer range weather forecasting.

The interactions between climate and agricultural economics are ubiquitous. The author renders an important service by stating many of these. The cost incidence of drought is "oversimplified," but Mr. Tannehill does not overstate cost magnitude. Price analysts and marketing economists will be interested in forecasting refinements as prerequisite to production estimates. Policy students may reconsider some of their analyses in harmony with evidence of non-random world weather interrelationships as interpreted by Mr. Tannehill. Relevance of this topic to production and land economics is, of course, obvious. For all, "Drought, Its Causes and Effects" should be an interesting reading experience.

ARNOLD BREKKE

University of Minnesota

Elements of Soil Conservation. H. H. Bennett. New York: McGraw-Hill Company, 1947. Pp. x, 406. $3.20.

Mr. H. H. Bennett, Chief of the Soil Conservation Service, has evangelized soil conservation for another group of people. This volume is designed for use as a text in introductory courses,—high school and college,—and as a source book for adult discussion groups,—"Friends of the Land," businessmen's associations, etc.

The material presented in this volume includes a large number of arresting facts taken from Mr. Bennett's long experience and from the records of the Soil Conservation Service, U.S.D.A. Pictures, maps, and charts are used freely. Interspersed throughout each chapter is a considerable amount of the author's philosophy. And at times his enthusiasm tends to imply greater meaning to his facts than is warranted. This volume is essentially a reprint of the first two-thirds of his earlier book (*Soil Conservation*, McGraw-Hill 1939). The first seven chapters deal with soil erosion,—extent, effects, rates, and causes, The remainder of the book presents what Mr. Bennett considers the elements of soil conservation,—a national

program for soil conservation and the agronomic and engineering devices used in preventing soil loss. This volume includes chapters on farm planning, drainage, and irrigation (9, 20, 21) not contained in the earlier volume. Mechanically the book is well designed as a text with a list of side headings at the beginning of each chapter, questions and additional references at the end of each chapter, and a list of visual aids which are available as supplements (page 277).

We must recognize that Mr. Bennett's objective is to create in all people an awareness of the need for soil conservation. This he has done well. To him should go considerable credit for the fact that farmers are more conscious of soil conservation now than they were ten years ago and for the fact that our legislators have seen fit to continue sizeable appropriations for soil conservation programs. The real questions in soil conservation, however, are (1) how much can individuals and society afford to invest to prevent soil loss and (2) how can individuals and society organize to conserve and develop land resources.

Mr. Bennett views these questions in physical terms, and hence his analysis of them should not be expected to be entirely satisfactory to the agricultural economist. Briefly his steps are as follows: The estimated cost of soil loss is about $3,844,000,000 annually (page 18). It pays to save all the soil (ideal soil conservation) because the cost of soil conservation is less than the cost of soil loss. Hence the farmer will practice soil conservation once he becomes acquainted with the soil losses on his farm and the methods required to prevent such losses. Mr. Bennett recognizes that a farmer may be limited by his "pocketbook" in carrying out a program which would prevent soil loss. But he goes on to say, "The closer the farmer can approach it and still make a good living the more stable and productive his land will be and the surer his income, over the long run." (page 160). Government's responsibility is to acquaint the farmer with the "facts" and help him develop a soil conservation plan for his farm.

There are several critical points in this argument. The generalization that it pays to conserve all soil is not warranted. It may pay to improve and develop some land beyond the point of preventing soil loss (chapters on Irrigation and Drainage). The individual and social costs necessary to prevent soil loss on some land may be so great in relation to benefits that investments in soil conservation are not justified. The farmer can be expected to practice soil con-

servation only in cases where his investment yields an additional return to him. But many of the benefits of soil conservation accrue to society and not the farmer. Also the market does not always reward the farmer who makes the investment in soil conservation with the additional returns. Such factors as tenure status, probable continuation of operating control, and life expectancy affect the division of the benefits and hence the willingness of the farmer to invest in soil conservation.

As a result of Mr. Bennett's assumption that individual farmers with technical assistance could afford to conserve and develop the soil adequately, he limits his program for soil conservation almost entirely to an educational program (chapter 8 and 9). To be sure, Soil Conservation Districts seem to be given a prominent place, but not for the purpose of local regulation of land use which is the main function of the district device. Rather he considers the formation of a district an expression of local interest in the problem which is necessary before the Soil Conservation Service will assign a "technician" to the area. Also he considers the district a device similar to a cooperative which can accept public funds for soil conservation and can lease and manage land. However, making farm plans by technicians and farmers appear to be the major part of Mr. Bennett's program for soil conservation (chapter 9). The responsibility of government is to furnish technicians which has the effect of limiting Mr. Bennett's program to education.

RAYMOND J. PENN

University of Wisconsin

Price-Quantity Interactions in Business Cycles. Frederick C. Mills. New York: National Bureau of Economic Research Inc. Twenty-fifth Anniversary Series No. 2., 1946. xii, 140 Pp. $1.50.

This is an interesting study of interaction of physical volume, unit price and monetary values in the American economy, using a sample of 64 prices. The period covered is 1858–1938. Only about half of the commodities however, go back as far as 1914. The following agricultural commodities are included in the sample: beef, bread, butter, cattle, coffee, corn, raw cotton, cotton yarn, crude and refined cotton seed oil, eggs, flour, hides, hogs, lard, leather, linseed oil, meat, condensed, evaporated and raw milk, pork, potatoes, rubber, sheep, raw silk, silk yarn, sugar, raw wool and worsted yarn.

The behavior of the 64 commodities is analyzed with the help of the method of reference cycles recently described in the publication of Arthur F. Burns and Wesley C. Mitchell (Measuring Business Cycles, New York, 1946.)

A number of novel descriptive measures of the cyclical behavior are developed. The average amplitude is the sum of the average expansion and contraction in the cycle. The joint cyclical variability is the sum of squares of the amplitudes of prices and quantities in the 9 stages of the business cycle. This measure has a certain resemblance to Gini's mean difference (see e.g. M. G. Kendall: Advanced Theory of Statistics, vol. 1, London 1945, pp. 43 ff.)

A price and a quantity component are distinguished in the joint cyclical variability. Cycle elasticity is the average response of quantity to price and other economic forces in the cycle. Flexibility is the average response of price to quantity and other economic forces in the cycle. The concepts are here used in a sense quite different from the usual one in economic theory.

The results achieved with the help of these measurements show a great diversity of various commodities and commodity groups. On the whole it appears that prices have a stronger and more consistent cyclical pattern than quantities. Elasticity and flexibility are on the average approximately equal to one. Durable goods, capital equipment and non-farm products have high joint cyclical variability, consumer's goods, foods, farm products and non-durables a low one.

Price variability is high relative to variability of quantities in markets close to the initial stage of extraction and the final stage of consumption. Foods show a particularly high flexibility. Prices are flexible and quantities are inelastic for farm products and for consumption goods in general.

The results are on the whole not surprising but confirm the expectations of most business cycle theorists about the cyclical behavior of prices and quantities.

In terms of the methods used and developed in the National Bureau this is a good study which is suggestive even to economists and statisticians who do not entirely agree with them. But the reviewer believes that these methods themselves are not adequate for an analysis or even an intelligent description of price and quantity behavior in the business cycle. A much more thorough theoretical basis is necessary than the one (tacitly) implied by the

various classifications of commodities into groups. More refined statistical techniques are also now available.

GERHARD TINTNER

Iowa State College

Economic Research and the Development of Economic Science and Public Policy. New York: National Bureau of Economic Research. 1946. pp. 198. $1.00.

These are twelve addresses commemorating the twenty-fifth anniversary of the founding of the National Bureau of Economic Research. The twelve speakers were invited to "take counsel on the tantalizing question how our knowledge of economic processes can best be improved, extended and used in the interests of society." The twelve papers are diverse in style and content and they follow no clearly defined line of development. However, there is general agreement among the speakers in respect to the kinds of problems to which economists should address themselves, the methods of analysis which should be used and the kind of empirically adduced and verified theoretical knowledge they should seek. Until recently, most economists held themselves apart from the functioning economy. Theory of the logico-arithmetic type was, with a few exceptions, almost entirely unrelated to the empirical inquiry. In the past quarter-century, covering the life of the National Bureau, economics has begun to become the science of the functioning economy. Theory has been re-oriented, and both the collection of data and the use of mathematical statistics have been continuously improved. Government has begun to take on responsibility for full employment and economic stability.

There is increasing recognition that economic analysis is significant insofar as it is pragmatically oriented. Great advance has been made in the solution of practical problems—particularly during the war years in which the economist was required to provide, quickly and accurately, quantitative forecasts as a basis for policy. The economist will probably neither want nor be permitted to withdraw from his function in providing data for policy making. There are wide ranges of important questions yet unanswered and for which no satisfactory techniques for solution are available. Most of the papers deal with the kinds of questions which should be engaged, the means by which uncertainty among economist may be diminished and a body of empirically verified generalizations of the natu-

ral science type may be built up. It is agreed that concepts should be qualified, and that each problem should be regarded as an integral phase of a broad inquiry into how the economy functions and how goals may be achieved. This does not mean that all economists should deal only with the solution of immediately practical problems to the exclusion of the advance of general knowledge. It does mean, however, that economists should deal with questions which can be answered and the answers to which are of some significance to people.

The size of national output, the stability of employment, the role of government and the interrationships of national economies are set out as examples of such questions.

G. L. MEHREN

University of California

A Century of Farming in Iowa 1846–1946. Iowa State College Staff Members, Ames, Iowa: Iowa State College Press, 1946, Pp. xiii, 353, index.

This book of 353 pages and 27 chapters includes contributions from 40 authors, all members of the staff of the Iowa State College. In this book is reported the development of modern technical agriculture in the state of Iowa. Most of the chapters are given an historical setting and the evolution of technology and development is carried through to the present time. The wide variety of subject matter treated and the diversity among the authors have resulted in a lack of continuity. The small amount of space assigned to each subject has made it necessary to give very summary treatment to most subjects. For example, Chapter One, "Struggle for Land Ownership," by W. G. Murray, tells the story of land ownership, land tenure, and the rise of mortgage debt in Iowa from the time of early settlement. This Chapter is very well done but of necessity only a superficial treatment can be given of this important subject in 17 pages.

For all practical purposes the book constitutes a report of the Agricultural College and the Experiment Station for the one-hundred years, 1846–1946. The development of scientific agriculture and the part played by the College in this development are the central theme of the book. Comparatively little space is given to the factors contributing to the evolution of Iowa farming other than those in which the College plays a controlling part. The book

is written in popular style at about the level of a good extension bulletin. Most of the material presented is that which is no doubt included in the present day extension program of the College. This material, however, is presented in a comprehensive manner in which each subject is related to the work of other departments. It is also given in an historical setting and from a philosophical point of view which adds greatly to its general cultural value. It constitutes a useful summary of the contribution of the College over the years and this book might well serve as a model for books of a similar nature which might be published for other important agricultural states.

E. C. YOUNG

Purdue University

PUBLICATIONS RECEIVED

Black, J. D., Clawson, M., Sayre, C. R. and Wilcox, W. W. *Farm Management*, New York: The Macmillan Co., 1947. Pp. 1055. $5.50.

Harding, T. Swann, *Two Blades of Grass: A History of Scientific Developments in the U. S. Department of Agriculture.* Norman, Oklahoma: University of Oklahoma Press, 1947. Pp. xv, 332.

Lorie, James H., *Causes of Annual Fluctuations in the Production of Livestock and Livestock Products*, Chicago: University of Chicago Press, 1947. Pp. 105. $1.50.

Malm, James C., *Dust Storms, 1850–1900*, Lawrence, Kansas: Kansas Historical Quarterly, 1946. Pp. 71.

Wilcox, Walter W., *The Farmer in the Second World War*, Ames Iowa: The Iowa State College Press, 1947. Pp. xii, 410. $4.00

NEWS NOTES

Edward Allen of Iowa State College died late in July, 1947.

A. T. Anderson has been appointed an extension specialist in Farm Management Extension at the University of Illinois with the rank of assistant professor. During the past year Mr. Anderson has been heading a project on community development in which various divisions of the University cooperated with the Bloomington, Illinois Pantagraph in a community development program in the circulation area of this paper.

W. J. Anderson, formerly assistant agricultural economist with the Economics Division, Canadian Department of Agriculture at Vancouver, who has been carrying on graduate work in Agricultural Economics at the University of Chicago during the past year, has been appointed associate professor of agricultural economics at the University of British Columbia.

Ralph Battles, Assistant chief of the Division of Economic and Credit Research, Farm Credit Administration, Washington, D. C., was in Japan during May and June for the War Department. His personal assignment was to survey existing agricultural credit facilities and make recommendations regarding reorganization of the Central Cooperative Bank for Agriculture and Forestry and establishment of an adequate credit system.

Walter Bauer, Principal Agricultural Economist of the Economic and Credit Research Division, Farm Credit Administration, Washington, D. C. was a member of a War Department mission to Germany during April, May and June. Its assignment was to assist with rural organization matters and in making a survey of ways and means of relating the economic problems of the German farmer and his group activities to our democratic way of thinking.

R. S. Beck recently resigned as extension economist in Vermont to accept a similar position in the state of Washington.

C. A. Becker resigned his position in Farm Management Extension at Michigan State College, effective May 1, and accepted a position in Poultry Marketing at Pennsylvania State College.

Karl Brandt, Economist and Professor of Agricultural Economics in the Food Research Institute of Stanford University returned at the end of May from a visit of two months in Western Europe. He attended an international conference of social scientists at Mont Pelerin, Switzerland, directed by Professor F. A. Hayek of the London School of Economics, and devoted to a discussion of the philosophy of freedom. In Geneva, Zurich, Paris, and Brussels Dr. Brandt discussed the economic situation in Western Europe with food and agriculture officials, and in Germany conferred with agricultural economists with reference to a volume dealing with the German management of food and agriculture in the Institute's International History of Food and Agriculture in World War II.

R. G. Bressler, University of Connecticut, Associate Professor of Agricultural Economics will attend the meeting of the International Conference of Agricultural Economists at Totnes, South Devon, England. While abroad, Dr. Bressler plans to spend some time studying some of the English marketing systems as background for his study of marketing research for the Social Science Research Council.

W. D. Buddemeier, formerly fieldman for the Blackhawk Farm Bureau Farm Management Service Association, has been appointed an assistant professor in Agricultural Economics, Farm Management Research, University of Illinois.

Gordon L. Burton and David L. MacFarlane have joined the staff of McGill University as Professors of Agricultural Economics in the faculty of agriculture at Macdonald College. Dr. Burton was formerly Assistant Professor of Farm Management at the University of Saskatchewan, while Dr. MacFarlane was employed in the Food Division of UNRRA for the past five years.

M. P. Catherwood was appointed Dean of the School of Industrial and Labor Relations at Cornell University, effective July 1, 1947. He succeeds Irving M. Ives, who resigned after his election to the U. S. Senate last fall. Dean Catherwood did his graduate work in Agricultural Economics. He was Professor of Public Administration in the Agricultural Economics Department at Cornell until 1939 when he was granted a leave of absence to help establish a new Division of Commerce in Albany. Since 1941 he has been Commissioner of the New York State Department of Commerce.

M. C. Conner who was on leave of absence to do graduate study at Cornell University during 1946–47 has returned to V. P. I. to continue his work in Marketing Research.

R. B. Corbett formerly with the American Farm Bureau Federation has returned to the University of Maryland as Associate Dean and Director of the College of Agriculture.

Paul J. Findlen, Federal Extension Service leader in fruit and vegetable marketing, left Washington, D. C., on June 24 as a member of a ten-man FAO agricultural mission being sent to Poland at the request of the Polish government to survey that country's major agricultural problems. Dr. Findlen has been granted leave from the Extension Service to participate in this mission and will be responsible for problems relating to the marketing and preservation of perishable products.

C. G. Garman has resigned his position with the U.S.D.A. and is now operating a fruit farm at Burt, New York.

H. W. Hannah, Associate Professor of Agricultural Economics at the University of Illinois, is giving up his duties as Director of the Division of Special Services for War Veterans and returning full time to the Depart-

ment of Agricultural Economics to continue his work in the field of agricultural law.

Albert H. Harrington, assistant professor at the State College of Washington, has been granted leave to continue his graduate work leading towards a Ph.D. degree at the University of Illinois.

V. B. Hart is serving as Director of the "Bankers' School of Agriculture," which was established at Cornell University in 1946. The second school will be held August 11–15.

T. R. Hedges, formerly Head of the Department of Rural Economics and Sociology at the University of Arkansas, joined the staff of the Division of Agricultural Economics of the University of California in July. Dr. Hedges will be headquartered at the College of Agriculture at Davis.

W. C. Hopper, formerly Principal Economist in the Economics Division, Canadian Department of Agriculture, has transferred to the Canadian Department of Trade and Commerce as Canadian Trade Commissioner (Agricultural Specialist), and is being posted to Australia in this capacity.

Mrs. Helena Janes, a first assistant in agricultural economics at the University of Illinois has resigned.

Edwin A. Johnson, formerly with PMA field service branch, central region, joins the Federal Extension Service economics section marketing staff June 29. Before entering government service Mr. Johnson devoted seven years to marketing extension work in Kentucky. He will give immediate attention to the consumer educational aspects of marketing extension work and assist particularly in the central states in general marketing extension work.

Joseph M. Johnson recently accepted a position as Associate Professor of Marketing at Virginia Polytechnic Institute, Blacksburg, Virginia.

H. R. Kling became Associate Agricultural Statistician in the Bureau of Statistics of the New York State Department of Agriculture and Markets last March 1. He had formerly been employed by the Philadelphia Milk Marketing Administration.

D. A. Marshall was on leave of absence from the Department of Agricultural Economics, University of Arkansas, for the spring semester, 1947, to complete his graduate work at Cornell University.

D. A. B. Marshall, formerly a member of the staff of the Canadian Agricultural Prices Support Board, is now engaged in studies of Foreign Agriculture in the Economics Division, Canadian Department of Agriculture, Ottawa.

Orlo Maughan, head of the Department of Agricultural Economics at Washington State College was killed in an airplane accident recently.

W. I. Myers, Dean of the College of Agriculture at Cornell University, was recently presented an "Award for Outstanding Achievement" by the Cornell Class of 1914. President Edmund E. Day made the presentation.

B. C. Ochojski has accepted a position as production control specialist in the canning division of the G. L. F. Cooperative.

R. O. Olson and A. P. Ruderman will become assistant professors of Agricultural Economics at South Dakota State College beginning September, 1947. Dr. Ruderman comes from Colgate University, Hamilton, New York and Professor Olson comes from the University of Minnesota.

C. V. Parker, formerly Economist on the staff of the Canadian Wheat Board, Winnipeg, has been appointed Director, Agricultural Division, Dominion Bureau of Statistics, Ottawa.

M. N. Penny completed the residence requirements for his doctor's degree at Cornell University in June and has returned to his position at the Georgia Agricultural Experiment Station.

E. A. Perregaux, Head, Department of Agricultural Economics, University of Connecticut, will complete a year's leave as research consultant with the American Institute of Cooperation at the end of the annual meeting of the Institute at Fort Collins, Colorado. He has arranged a conference of teachers of Agricultural Cooperation at Fort Collins for the week prior to the Institute.

Arthur W. Peterson has been promoted to the rank of full professor at the State College of Washington.

C. V. Plath completed his graduate work for a doctor's degree at Cornell University in June and has accepted a position in the Department of Agricultural Economics at Purdue University. He will be doing land utilization work.

Gerald G. Quackenbush has been appointed Assistant Professor of Economics (Agricultural Economics) at Michigan State College. Dr. Quackenbush completed his graduate program at Purdue in June. At Michigan State he will work primarily in the field of dairy marketing.

J. B. Rutherford, formerly Director, Agricultural Division, Dominion Bureau of Statistics, Ottawa, has accepted a position in the Economics and Statistics Division of the Food and Agriculture Organization in Washington.

Raymond E. Seltzer has been appointed Associate Economist in the Department of Agricultural Economics, University of Arizona. His work will be confined to marketing research and teaching. Mr. Seltzer has degrees from the University of Illinois and the Kansas State College of Agriculture.

Frank Shefrin, Agricultural Economist, Economics Division, Canadian Department of Agriculture, Ottawa, completed the requirements for his master's degree at Iowa State College in June and is continuing graduate work in Agricultural Economics at the University of Chicago during the summer session.

W. Bruce Silcox will return to the U. S. Department of Agriculture Extension Service economics section on June 29, following several years with the PMA dairy branch. Dr. Silcox takes up his former position as extension leader in dairy and poultry marketing.

Ross Silkett of the Economic and Credit Research Division, Farm Credit Administration, Washington, D. C. was a member of a War Department mission to Germany during April, May and June. Its assignment was to advise on problems of restoring an effective system of agricultural education and research, including the revitalization of agricultural schools and research institutions.

Robert P. Story, has been appointed Instructor in Agricultural Economics and Assistant Agricultural Economist in the Vermont State Experiment Station effective July 1. As of the same date, Dr. Thurston M. Adams was promoted from Associate Professor to Professor of Agricultural Economics, Dr. Robert M. Carter from Assistant Professor to Associate Professor of Rural Sociology, and Dr. Sheldon W. Williams from Assistant Professor to Associate Professor of Agricultural Economics.

Maurice C. Taylor has completed work for his master's degree in Agricultural Economics and has accepted a position in the Department of Agricultural Economics at the State College of Washington.

P. J. Thair, formerly Assistant Economist in the Economics Division, Canadian Department of Agriculture, Ottawa, who has been continuing his graduate studies at Iowa State College during the past year has been awarded a Social Science Research Fellowship.

John F. Timmons has accepted a position as professor of land economics at Iowa State College. Dr. Timmons, formerly acting head of the land tenure section in the Land Economics Division of the Bureau of Agricultural Economics, will have charge of teaching and research in land economics.

Vladimir P. Timoshenko, Economist and Professor of Commodity Economics at the Food Research Institute of Stanford University, completed in May his term of service with the Economics Division, Office of Military Government (U.S.), Berlin, where he has served as chief of the production policies and program section in the Food and Agriculture Branch. Dr. Timoshenko has been on leave from the University since February 1946 to fulfill this assignment. Before returning to the United States in September, Dr. Timoshenko will visit Switzerland, Italy, France, Belgium, The

Netherlands, and Great Britain, gathering materials relative to sugar developments in Europe.

H. R. Varney resigned his position in Vermont July 1, 1947 to become Dean of the College of Agriculture at New Mexico State College.

Harold G. Walkup has completed work for his master's degree in Agricultural Economics and has accepted a position in the Department of Agricultural Economics at the State College of Washington.

E. G. Woodward, Department of Agricultural Economics, University of British Columbia, has joined the staff of the Economics Division, Canadian Department of Agriculture with headquarters at Vancouver.

E. J. Working, who was on leave of absence during the first semester to work at the University of Chicago on a study dealing with the demand for meat, returned to the University of Illinois for the second semester.

A research project attempting to define the scope and methods of forest economics has just been announced by the Charles Lathrop Pack Forestry Foundation and the Society of American Foresters.

The object of this study is to point up the economic problems of American forestry, and to clarify the nature of research needed to help solve them. It is hoped that some better organization of the basic principles of forest economics will eventuate, to provide future workers with more effective tools, and that a closer definition of the field may be reached, thus making it more attractive to able researchers and students.

Begun on July 1, under the joint sponsorship of the Foundation and the Society of American Foresters, the project was formulated by a committee of the Society's Division of Forest Economics, and will be carried out by the committee, under the chairmanship of William A. Duerr, a senior member of the society, and a member of the American Farm Economic Association. Other members of the committee who will participate in the study are Henry J. Vaux, of the California Forest Experiment Station, and Charles H. Stoddard, of St. Paul, Minn., Project Leader for the Pack Foundation's current study of forest farming.

The decision of the Foundation to support the project was based on its recognition of the relatively undeveloped status of forest economics and of the need for the inclusion of forest economics research of a high order in the solution of many major forestry problems.

It is expected that at least three years will be required to complete the study, and that it will culminate in a two-part report tentatively titled "Scope and Method of Research in the Economics of Forestry." It is planned that Part 1 will contain a general discussion of the economics of forestry, the economic problems of forestry, and the types of research needed to help solve them; Part 2 will embody a "case-method" series of study statements, each of which will define a specific research problem, and then consider the best ways of studying it, including the data needed, and the best methods of analysis. These statements will be sought from expe-

rienced foresters and economists, the country over, and it is hoped that their contributions will give not only a comprehensive picture of the many fields of forest economics—scuh as forest land use, forest management, industry, marketing and prices of forest products, consumption, income, employment, etc.—but also of the various research methods applicable.

For the project to succeed, the committee must win the collaboration of as many as possible of the men with research experience who can contribute to the bulletin. Aiding the committee in its search for such contributors, as well as in its review of writings submitted, will be a group of advisers representing the different branches of the economics of forestry.

Inquiries or suggestions regarding the project should be addressed to William A. Duerr at 5618 Canal Boulevard, New Orleans 19, La.

The following back issues of the JOURNAL are needed. If you have usable copies, the secretary-treasurer will pay $1 each for:

Vol. XXVIII	(1946) No. 1 (Feb.), 2 (May), 3 (Aug.)
Vol. XXVII	(1945) No. 2 (May)
Vol. VI	(1923) No. 1 (Feb.)
Vol. V	(1922) No. 1 (Feb.)
Vol. IV	(1921) No. 1 (Feb.), 2 (May), 3 (Aug.), 4 (Nov.)
Vol. III	(1920) No. 1 (Feb.), 2 (May)
Vol. I	(1918) No. 1 (Feb.), 2 (May), 3 (Aug.), 4 (Nov.)

L. J. Norton, Secretary-Treasurer
305 Mumford Hall
University of Illinois
Urbana, Illinois

OBITUARIES

ALAN MACLEOD

Alan Grover MacLeod, Secretary of the New England Research Council from 1940 until his death on June 28, 1947, was born 42 years ago in Arlington Heights, Massachusetts. His boyhood was spent in Canada and he was graduated from the University of Saskatchewan as a chemist in 1927. Later he became interested in agricultural economics and studied at Harvard University in 1931 and 1932, receiving his Ph.D. degree in economics in 1941. He spent some time as a Consultant for the Brookings Institution in Washington and later served on the staffs of the University of New Hampshire and the University of Connecticut. During the summer of 1945, he was Economic Advisor to the Rehabilitation Committee for the Province of Manitoba, Canada, and was responsible for the preparation of a postwar planning report for that Province.

As Executive Secretary of the New England Research Council, Alan was a field agent of the Bureau of Agricultural Economics with headquarters in Boston, Massachusetts and, during the war years, in Storrs, Connecticut. He worked closely with agricultural economists in the New England States and was one of the leaders in the development of coordinated dairy marketing research projects for the Land Grant Colleges and Experiment Stations in the Northeastern and North Central regions. His work on a regional basis served as a model for many of the current proposals for regional work under the new Research and Marketing Act. He was a member of the Bureau of Agricultural Economics Committee on Economic Research in Marketing and of the Marketing Research Committee of the American Farm Economic Association. He was the author of many bulletins and articles in the field of agricultural economics, especially in dairy marketing.

There are few men of Alan's age who have reached such eminence in their field of work. The important positions he held speak eloquently of his outstanding ability and of the confidence which others had in him. His associates and friends had a profound respect for his thoroughness in research and his objectivity and intellectual integrity. These were combined with patience and calmness and a warm sense of humor that made him the friend of all who worked with him.

Dr. MacLeod is survived by his wife and two daughters and by his parents.

WALDO E. GRIMES

In the death of Dr. W. E. Grimes, agricultural economics lost an outstanding leader and an inspiring teacher; Kansas State College lost a forceful and loyal administrator; the community lost a civic leader who gave unstinted service; and members of his staff lost not only a professional adviser but a sincere and trusted friend. His death was caused by cerebral hemorrhage on May 23, 1947.

Born at Lee's Summit, Missouri, October 5, 1891, Dr. Grimes obtained his first experience in farm management on the home farm. He obtained formal training and enriched his experience by study at Kansas State College, where he received the degree of Bachelor of Science in Agriculture in 1913; by superintending the College's agronomy farm for one year; and by study at Cornell University in 1914–15 with Dr. George F. Warren, then the outstanding farm management specialist in the United States. At the University of Wisconsin, where he received the Ph.D. degree in 1923, he studied under Richard T. Ely, William A. Scott, and Benjamin H. Hibbard.

On September 15, 1914, Waldo Grimes had the good fortune to marry Ethel Roseberry, whose help and solicitude were an invaluable contribution to him, to their family of four children, and to the morale and fellowship of the departmental personnel.

Dr. Grimes was assistant professor of farm management, Kansas State College, 1915–18, and associate professor of agricultural economics, 1918–21. Since 1921 he was professor in charge of the Department of Agricultural Economics and since 1936 head of the Department of Economics and Sociology. He served as acting dean of agriculture and acting director of the Kansas Agricultural Experiment Station in 1934–35, and as visiting professor at the University of Chicago during the spring quarter of 1939.

He was a member of the American Economic Association, American Farm Economic Association (president in 1935), American Association for the Advancement of Science, Phi Kappa Phi, Sigma Xi, Alpha Zeta, Gamma Sigma Delta (past national president), Pi Kappa Delta, Pi Kappa Alpha, Manhattan Chamber of Commerce, Manhattan Rotary Club (past president), the Manhattan Country Club, and the Methodist Church.

Solely or as joint author he wrote extensively, his works including 44 bulletins, circulars, and professional papers; two books, *Making the Most of Agriculture* and *Modern Agriculture;* numerous articles

in farm papers; and book reviews for economic journals. If he had pursued a policy of including his name on all manuscripts on which he had a directing influence and on which he spent many hours in giving constructive criticism, the number of publications to his credit probably would have been at least doubled. One of his favorite mottoes was: "There is no limit to the amount of good a man can do if he does not care who gets the credit."

Throughout the quarter-century, under Dr. Grimes' direction and with his extensive participation, the department conducted numerous research projects independently or in cooperation with other agencies. Among these projects were those in the fields of farm management, taxation, land tenure, marketing, business management, and sociology. The results of this research have been applied extensively in the agriculture, industry, and government of Kansas and adjacent states. In addition to research, a great deal of service work was done for farmers and others interested in economic questions.

Some of his manifold activities aside from his regular administrative, teaching, and research duties are indicated by the fact that he was secretary-treasurer of the following organizations: three College mutual aid organizations—Teachers and Employees Association, Mutual Benefit Association, and Hospital Service Association; Kansas State College Endowment Association, Kansas State College Building Association, Pi Kappa Alpha Association, and the Intrafraternity Alumni Council of Kansas State College; secretary of the Board of Trustees of Wesley Foundation at K.S.C. and of the Committee on Intra-State Industrial Research Relations; and treasurer of the Alumni Association of K.S.C. and of all student loan funds. He was also prominent in many other activities—educational, religious, and civic.

Dr. Grimes is survived by his wife, Mrs. Ethel Grimes; one son, Ted Grimes, a student at Kansas State College; two daughters, Sarah Anna Grimes, Washington, D. C., and Mrs. Rosethel Elder, Fort Collins, Colorado. Another son, Eugene Grimes, was killed in a plane crash near Manhattan on August 18, 1946.

J. A. H.

PRELIMINARY ANNOUNCEMENT

PROGRAM OF THE ANNUAL MEETING—AMERICAN FARM ECONOMIC ASSOCIATION

NORTHERN BAPTIST ASSEMBLY,
GREEN LAKE, WISCONSIN

SEPTEMBER 8, 9, 10, 11, 1947

Monday, September 8

Morning

9:00–10:00

Getting acquainted with your colleagues and your environment. (There will be no separate association registration. Your registration at the Administration Building at time of arrival will serve Association purposes.)

9:00

Executive Committee, Conference Room 1, Brayton Case

11:00–11:45

Matters International, Morehouse Hall
Chairman: To be announced

1. The World Food Situation, Its Development and Outlook
   J. N. Lewis, International Emergency Food Council
2. Significance of the Geneva Trade Conference to United States Agriculture
   John A. Hopkins, Office of Foreign Agricultural Relations
3. The Dollar Position of our Foreign Buyers
   Oscar Zaglits, Office of Foreign Agricultural Relations

Discussion

Wilfred Malenbaum, Department of State

11:45–12:00

General Assembly, Morehouse Hall
Arrangements, Plans, Announcements

Afternoon

2:00

I. *Training Agricultural Economics Majors*, Morehouse Hall
Chairman: J. I. Falconer, Ohio State University

1. Some Considerations in Building a Curriculum for Agricultural Economics Majors
   Speaker to be announced

2. Training Agricultural Economics Majors for Business Careers
   G. Burton Wood, Purdue University
3. Training Agricultural Economics Majors for Public Careers
   Kenneth H. Parsons, University of Wisconsin

Discussion

A. A. Dowell, University of Minnesota
Oscar A. Day, Wilson and Company
Clayton V. Taylor, United States Civil Service Commission

II. *Statistical Problems*, Brayton Case, Room A
Chairman: F. V. Waugh, Council of Economic Advisers

1. Estimating the Relation between Consumption and Price
   Elmer Working, University of Illinois
2. Construction of State Index Numbers of Farm Prices
   Warren C. Waite, University of Minnesota
3. Types of Farm Income by Size
   Nathan Koffsky, Bureau of Agricultural Economics

Discussion from the floor

III. *Capital Requirements of Agriculture*, Conference Building, Second Floor
Chairman: H. C. M. Case, University of Illinois

1. Methods of Financing Related to Asset Characteristics of Farms
   Donald C. Horton, Bureau of Agricultural Economics
2. Capital Returns from Soil Conservation Practices
   S. von Ciriacy-Wantrup, University of California

Discussion

G. W. Forster, University of North Carolina
Horace G. Porter, Federal Reserve Bank, Richmond
Aaron G. Nelson, Farm Credit Administration, Omaha

IV. *Land*, Brayton Case, Room B
Chairman: to be announced

1. The Present Situation and Important Trends in Land Ownership in the United States
   John F. Timmons, Iowa State College
2. Current Issues and the Future of Federal Land Management in the Western United States
   M. M. Kelso, Montana State College
3. Benefit Evaluations of Land and Water Conservation Measures
   M. M. Regan and Everett Weitzell,
   Bureau of Agricultural Economics

Discussion

Norris J. Anderson, Kansas State College
Raymond J. Penn, University of Wisconsin
Jack Holmes, University of New Mexico

Evening

8:00

Redefining Parity Price and Parity Income, Morehouse Hall
(A Committee Report)

Chairman: R. J. Eggert, American Meat Institute

Presentation of Committee Report by the Chairman
H. R. Wellman, University of California
A Minority Statement
O. V. Wells, Bureau of Agricultural Economics
Summary
R. K. Froker, University of Wisconsin
Discussion from the floor

Tuesday, September 9

Morning

5:30–8:30—Fishing, Golf, Tennis, Swimming, Boating

10:00

I. *Application of Statistical Methods to Farm Management Research* —Craft Shop
Chairman: G. A. Pond, University of Minnesota
1. Sampling Techniques Applied to Farm Management Research
Earl E. Houseman, Bureau of Agricultural Economics
2. Appropriate Statistical Procedures for Analyzing Farm Management Data
P. G. Homeyer and E. O. Heady, Iowa State College
3. Tests of Reliability for Farm Management Data
Speaker to be announced

Discussion

Charles F. Sarle, Bureau of Agricultural Economics

II. *The Federally Sponsored Credit Services to American Agriculture* (First Session), Brayton Case (Report of a Research Committee on Organization and Functions) Room A
Chairman: Walter B. Garver, Federal Reserve Bank, Chicago

1. Conditions and Problems the System Should be Designed to Meet
Karl Brandt, Food Research Institute
2. Suggestions for Strengthening the "Cooperative" Credit System
M. R. Benedict, University of California

3. Providing Needed Services Related to Credit
   Glen Hedlund, Cornell University

Discussion

F. W. Peck, Farm Foundation
R. I. Nowell, The Equitable Life Assurance Society
H. B. Munger, Farm Credit Administration, Springfield, Massachusetts

III. *Regional Cooperation in Marketing Research*, Morehouse Hall
Chairman: To be announced
(Speakers to be announced)

1. Regional Projects to be Financed by Flanngan-Hope Funds
2. Some Problems Involved in Regional Research
   a. Types of Studies Best Suited to Regional Collaboration and Agencies that May Participate
   b. Extent of and Arrangements for Collaboration Among Participating Agencies
   c. Provisions for Preparation and Publication of Reports
   d. Apportionment of Funds

IV. *Cooperatives in a Capitalistic Society*, Conference Building, Second Floor
Chairman: E. A. Perregaux, University of Connecticut

1. Cooperatives in a Capitalistic Economy
   Fred Koller, University of Minnesota
2. Place of Cooperatives in a Sound Farm Economy
   John W. Davis, National Council of Farmer Cooperatives

Discussion

Martin Abrahamsen, University of North Carolina
Harold Hedges, Farm Credit Administration
Raymond W. Miller, American Institute of Cooperation
W. L. Bradley, Certified Public Accountant, Buffalo, New York

Afternoon

2:00–3:30

Agriculture and the National Economy, Morehouse Hall
Chairman: J. K. Galbraith, Fortune Magazine

1. Stabilization of the General Price Level
   J. Carroll Bottum, Purdue University
2. Effects of Employment upon Factor Costs in Agriculture
   T. W. Schultz, University of Chicago

Discussion from the floor

3:30–4:30

Ladies' Tea—Terrace, Roger Williams Inn
Everybody Invited
Sponsored by Wisconsin Members, American Farm Economic Association

Evening

8:00

I. *Sampling Methods in Use in Farm Management Research*—Craft Shop
Chairman: Walter W. Wilcox, University of Wisconsin

A ten minute presentation of methods actually used will be made by each of the following:
K. T. Wright, Michigan Station
P. E. Johnston, University of Illinois
L. C. Cunningham, Cornell University
B. R. Hurt, Bureau of Agricultural Economics
S. A. Engene, University of Minnesota
Discussion from the floor

II. *The Federally Sponsored Credit Services to American Agriculture* (Second Session), Brayton Case, Room A
Chairman: To be announced

1. "The Direct Loan System," Policies and Organization
George H. Aull, Clemson College
2. Other Governmental Credit Services to Agriculture as Related to the Principal Farm Credit Agencies
William G. Murray, Iowa State College

Discussion

Frank J. Welch, Mississippi State College
(Other discussants to be announced.)

III. *New Approaches to the Study of Marketing Problems*—Morehouse Hall
(Illustrated by reports on recent or current studies)
(Speakers to be announced)

IV. *The Role of the Agricultural Economist in Farm Organization* Programs and Policies—Indian Village Lodge
Chairman, Milo Swanton, Wisconsin Council of Agriculture, Cooperative

1. The Nature of the Needs of Farm Organization Leaders for Basic Agricultural Economic Data
Lawrence H. Simerl, Illinois Agricultural Association
2. The Role of the Farm Organization Economist in the Formulation of Farm Organization Policy

Louis F. Herrmann, National Cooperative Milk Producers Federation

3. Problems of Effective Presentation of Agricultural Economic Data to the Membership of Farm Organizations
   Lloyd C. Halvorson, National Grange
4. The Use of Agricultural Economic Data as a Basis for Legislative Action
   Russell Smith, National Farmers Union

Discussion

W. Gordon Leith, National Council of Farmer Cooperatives

Wednesday, September 10

Morning

5:30–8:30—Fishing, Golf, Tennis, Swimming, Boating

10:00

I. *Twenty-five Years of the Bureau of Agricultural Economics Past, Present, and Future*—Morehouse Hall
Chairman: H. C. Taylor, Farm Foundation

1. The Early Years
   Lloyd S. Tenny, Hilton, New York
2. The Years in Between
   John D. Black, Harvard University
3. The Horizon
   O. V. Wells, Bureau of Agricultural Economics

Discussion from the floor

Afternoon

1:30

Excursion (Arranged by I. F. Hall, University of Wisconsin)
Obtain descriptive circular regarding details from Association Information Desk in Lobby, Roger Williams Inn.

Evening

8:00

Round Tables

I. *The Use of Agricultural Statistics in Research, Extension, Marketing and in Schools*—Morehouse Hall
Chairman: E. W. Gaumnitz, National Cheese Institute

1. Data Needs for Agricultural Research and Marketing
   R. L. Gillett, Agricultural Statistician, New York
   M. C. Bond, Cornell University

Discussion

A. C. Hoffman, Kraft Foods Company

2. Agricultural Data Needs in Extension Work

Clarence D. Caparoon, Agricultural Statistician, Wisconsin
E. A. Jorgenson, University of Wisconsin

Discussion

Speaker to be announced

3. The Use of Agricultural Statistics in Schools
   Walter H. Ebling, Agricultural Statistician, Wisconsin
   L. M. Sasman, Department of Vocational Education, Wisconsin

Discussion

S. J. Gilbert, Agricultural Statistician, South Dakota

II. *History and Agricultural Economics*—Indian Village Lodge
Chairman: Earl D. Ross, Iowa State College

1. The Methods and Objectives of Agricultural Economics
   Bushrod W. Allin, Bureau of Agricultural Economics
2. History and Agriculture
   Speaker to be announced

Discussion

Theodore Saloutos, University of California, Los Angeles
W. H. Glover, Wisconsin Historical Society

III. *Farm Management Extension*—John Clark Lodge
Chairman: Carl Malone, Iowa State College
Program to be arranged.

IV. *Work Simplification*—Brayton Case, Room A
Chairman: S. A. Engene, University of Minnesota

1. Recent Significant Developments in Work Simplification Research
   R. M. Carter, University of Vermont
2. Teaching Work Simplification on the College Level
   S. A. Engene, University of Minnesota
3. A Manual on Work Simplification in Agriculture
   L. M. Vaughan, Extension Service, United States Department of Agriculture

Discussion from the floor

V. *Econometric Models in Agriculture, Problems in Construction and Interpretation*—Conference Building, Second Floor
Chairman: T. W. Schultz, University of Chicago

1. The Role of Econometric Models in Agricultural Research
   Gershon Cooper, University of Chicago
2. The Use of Econometric Models in Agricultural Microeconomic Studies
   George M. Kuznets, University of California, Berkeley

3. The Use of Econometric Models in the Study of Agricultural Policy
   D. Gale Johnson, University of Chicago

Discussion

M. Bronfenbrenner, University of Wisconsin
J. P. Cavin, Bureau of Agricultural Economics

VI. *Farm Management Teaching*—Craft Shop
Chairman: E. B. Hill, Michigan State College

Course Outlines now in use in the basic farm management courses will be presented by:
L. H. Brown, Michigan State College
D. A. Paarlberg, Purdue University
W. N. Thompson, University of Illinois
S. W. Warren, Cornell University

Thursday, September 11

Morning

5:30–8:30—Fishing, Golf, Tennis, Swimming, Boating

9:30–10:30—Business Meeting, Morehouse Hall

10:30—*International Organizations*—Morehouse Hall
Chairman: To be announced.
1. International Federation of Agricultural Producers
   Allan B. Kline, Iowa Farm Bureau Federation
2. The International Conference of Agricultural Economists, Retrospective and Prospective
   L. J. Norton, University of Illinois

Discussion from the floor

12:30—Luncheon Meeting—Rogers Williams Inn
The Rural Planning Program in England
Chairman: Asher Hobson, University of Wisconsin

1. The Program
   A. N. Duckham, British Embassy, Washington, D. C.
2. An Appraisal
   W. M. Drummond, Ontario Agricultural College, Canada

Discussion

John M. Cassels, Department of Commerce

ANNUAL MEETING AMERICAN FARM ECONOMIC ASSOCIATION

GREEN LAKE, WISCONSIN

SEPTEMBER 8–11, INC., 1947

Train and Bus Schedules for Reaching Green Lake, Wisconsin

Members traveling to Green Lake by train are urged to arrive on Sunday, September 7. Busses will meet the train arriving at Fond du Lac Sunday at 12:10 and at 6:40. A bus will also meet the Saturday night train arriving Green Lake at 7:38. If the demand is sufficient, a bus can be arranged for to meet the Saturday train arriving in Fond du Lac at 12:50. There is no Sunday train to Green Lake.

Chicago North Western Railroad Line

	Leave Chicago	Leave Milwaukee	Arrive Fond du Lac	Arrive Green Lake
Sundays	9:30 A.M.	11:02 A.M.	12:10 P.M.	———
Sundays	4:10 P.M.	5:35 P.M.	6:40 P.M.	———
Week Days	9:45 A.M.	11:15 A.M.	12:50 P.M.	———
Week Days	4:10 P.M.	5:35 P.M.	6:40 P.M.	7:38 P.M.

Those coming from Minneapolis and the Northwest should plan to make connections through Milwaukee.

Greyhound Bus Line

Leaves Milwaukee	Arrives Green Lake
10:20 A.M.	1:28 P.M.
4:00 P.M.	6:50 P.M.

Be sure to notify J. C. Clark, Green Lake, Wisconsin, of the time and place of your arrival and whether coming by train, bus or private car. Also state first meal.

The next Annual Meeting of the American Farm Economic Association will be held at Green Lake, Wisconsin September 8 to 11 Inclusive, 1947.

SEE PAGE 799 FOR ANNOUNCEMENT

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THE JOURNAL OF FARM ECONOMICS is published quarterly, February, May, August and November by The American Farm Economic Association. Yearly subscription $5. Published at Menasha, Wisconsin.

Editorial communications including manuscripts submitted for publication, books for review or inquiries concerning the JOURNAL should be addressed to Warren C. Waite, Division of Agricultural Economics, University Farm, St. Paul 1, Minnesota.

Applications for membership or inquiries regarding the general affairs of the Association should be addressed to L. J. Norton, 305 Mumford Hall, University of Illinois, Urbana, Illinois.

Nonmember subscription rates $5 annually.

GEORGE BANTA PUBLISHING COMPANY, MENASHA, WISCONSIN